Method, Structure, and Development in al-Fārābī's Cosmology

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Method, Structure, and Development in al-Fārābī's Cosmology

By

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To my family and my wife Eurydice

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This book grew out of my Ph.D. dissertation submitted to McGill University in February 2009. While some of the views expressed are identical, the bulk of the book has been rewritten and its structure drastically modified. I have found it particularly challenging to achieve this task, and this for two main reasons. First, the scholarship on al-Fārābī is increasing rapidly, and it is difficult to keep track of all the new studies being published on this fascinating and enigmatic thinker. In the mere two years since the completion of my dissertation, scores of articles have appeared, some of them of crucial relevance to the contents of this work. Second, virtually every aspect of al-Fārābī's philosophical system is the object of controversy or serious disagreement among scholars. This is true not only of his main philosophical doctrines, but also of the authorship or authenticity of many of his works. Even his exact name and place of birth are disputed, which shows the intractable nature of the subject.

In spite of these challenges, I strove in the present work both to synthesize the recent scholarship on al-Fārābī's metaphysics and cosmology and to open new analytical perspectives in order to contribute to a resolution of some of the most outstanding problems regarding his thought. In this regard, there are many people I have had a chance to meet these last few years who have helped me in various ways with my research. I am grateful to all of them, but I would like to express my profound gratitude in particular to:

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ABBREVIATIONS

CAG=Commentaria in Aristotelem graeca.
EI²=Encyclopaedia of Islam, Second Edition.
EI³=Encyclopaedia of Islam, Third Edition.

Proclus:
Elements=Elements of Theology

Alexander of Aphrodisias:
Mabādiʾ=Risālah fī mabādiʾ l-kull

Neoplatonica arabica:
Maḥḍ al-khayr=Kalām fī maḥḍ al-khayr

Al-Fārābī:
Aghrāḍ=Fī aghrāḍ al-ḥakīm fī kull maqālah min al-kitāb al-mawsūm bi-l-ḥurūf
Ārāʾ=Mabādiʾ ārāʾ ahl al-madīnah al-fāḍilah
Burhān=Kitāb al-burhān
Daʿāwā=Al-daʿāwā l-qalbiyyah
Fī l-ʿaql=Risālah fī l-ʿaql
Fī mā yanbaghī=Fī mā yanbaghī an yuqaddama qabl taʿallum al-falsafah
Fuṣūl=Fuṣūl munṭazaʿah
Fuṣūl mabādiʾ=Fuṣūl mabādiʾ ārāʾ ahl al-madīnah al-fāḍilah
Ḥurūf=Kitāb al-ḥurūf
Iḥṣāʾ=Kitāb iḥṣāʾ l-ʿulūm
Ithbāt=Risālah fī ithbāt al-mufāriqāt
Jamʿ=Kitāb al-jamʿ bayna raʾyay al-ḥakīmayn
Jawābāt=Jawābāt li-masāʾil suʾila ʿanhā
Mūsīqā=Kitāb al-mūsīqā l-kabīr
Radd=Al-radd ʿalā Yaḥyā l-Naḥwī
Siyāsah=Al-siyāsah al-madaniyyah
Taḥṣīl=Kitāb taḥṣīl al-saʿādah
Taʿlīqāt=Kitāb al-taʿlīqāt
ʿUyūn=ʿUyūn al-masāʾil

Ibn Sīnā:
Ishārāt=Kitāb al-ishārāt wa-l-tanbīhāt
Mabdaʾ=Al-mabdaʾ wa-l-maʿād
Najāh=Kitāb al-najāh
Shifāʾ=Kitāb al-shifāʾ

Maimonides:
Guide=The Guide of the Perplexed

INTRODUCTION

Al-Fārābī (d. 950 CE), also known as the 'Second Teacher' or 'Second Master' (*al-muʿallim al-thānī*) after Aristotle in the Arabic tradition, is unanimously regarded as one of the great philosophers of the Middle Ages. As early as 1869, the Bohemian orientalist Moritz Steinschneider published a detailed study of this thinker's life and works, thereby inaugurating a long tradition of Fārābīan scholarship in the West. However, in spite of the sustained academic interest this work triggered and the publication of several recent books devoted to al-Fārābī, his cosmology has not yet been the object of a specialized monographic study.[1] This is regrettable, given the crucial role it played in shaping the subsequent development of medieval Arabic and Jewish thought. Al-Fārābī's cosmological model was the one adopted by Ibn Sīnā (or Avicenna) (d. 1037 CE); it was (in its Avicennan form) the main object of attack of al-Ghazālī's (d. 1111 CE) *Tahāfut al-falāsifah*; and it was this same model that was in turn defended and criticized by Ibn Rushd (d. 1198 CE) and Maimonides (d. 1204 CE). As D. De Smet recently showed, it also exercised a deep influence on the Ismāʿīlī tradition and especially on Ḥamīd al-Dīn al-Kirmānī (d. 1021 CE).[2] The profound and variegated legacy of al-Fārābī's cosmology in Arabic intellectual history calls for a sustained investigation and a clearer understanding of this aspect of his philosophy.

This study provides a new interpretation of al-Fārābī's cosmology and philosophical development through an analysis of the Greek and Arabic sources and a contextualization of his life and thought in the cultural and intellectual milieu of his time. It attempts to reconstruct a comprehensive yet nuanced picture of al-Fārābī's theories of the structure and essence of the heavenly world, of the various principles that govern it, as well as of the human capacity to study it. On the one hand, the book analyzes a cluster of key cosmological and metaphysical concepts, namely, celestial substance, causation, intellection, and motion, whose articulation in al-Fārābī's works marked an important shift in early Arabic intellectual history. In addition to partially tracing the

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[1] See notably Vallat (2004), Colmo (2005), and Parens (2006).
[2] De Smet (2008).

genealogy of these concepts in the ancient Greek philosophical background, the book seeks to identify some of the stages of adaptation and transformation they went through in the early Arabic context and to define the new meaning they acquired in al-Fārābī's thought as a result of this process. On the other hand, al-Fārābī's philosophical activity is defined in light of the social, cultural, and intellectual climate of his day. The main purpose of this dual textual and contextual approach is to study al-Fārābī's thought as the philosophical expression of a particular time and place, namely, the vibrant and cosmopolitan society of tenth-century Baghdad. This approach, which has not been fully exploited in the past in Fārābīan studies, can best enable us to grasp the historical development of his philosophical ideas. While it is not without its own pitfalls, this framework provides a valuable corrector to the ahistorical approach that has so often been relied upon to interpret al-Fārābī's philosophy.

Emphasis is placed on the relation between astronomy, physics, and metaphysics, the 'chief cosmological sciences,' and on how these disciplines interrelate in terms of both methodology and content in the Second Teacher's cosmology. The study adopts an interdisciplinary framework that bridges the history of astronomy and philosophy and pays special attention to the place of astronomical theories in the Second Teacher's cosmology, an issue that is still poorly understood with regard to this thinker and to the *falāsifah* in general. In that sense, this book may be regarded as a case study of how astronomical theory fits into the broader philosophical system of a medieval philosopher.[3] To what extent is this science reconciled—or does it conversely interfere—with the other philosophical disciplines? To what extent is al-Fārābī's astronomical model indebted to Ptolemy (d. ca. 168 CE), and how does it relate to the Arabic astronomical tradition? What role do astronomy, physics, and metaphysics play in explaining the causes of celestial motion, a crucial problem in medieval cosmology? In order to shed light on these issues, I examine the interactions—and sometimes the tensions—between these sciences in al-Fārābī's works. This approach has the advantage of bringing together various disciplines

[3] A precedent for this approach may be found in Morrison's study (2007); see also Janos (2011) for Ibn Sīnā. Morrison focuses on the dialectic between Arabic astronomy and theology in the works of the fourteenth-century author al-Nīsābūrī and examines how these two disciplines mutually shaped one another. His book opens many interesting avenues for future research.

that have evolved in separate directions over time, but which many medieval thinkers regarded as being closely linked or interrelated.

Al-Fārābī's method and his interpretation of the various philosophical and scientific sources are analyzed in detail. One of the study's overarching aims in this regard is to show that al-Fārābī was able to elaborate a new cosmological model chiefly as a result of a sustained and creative interpretive approach to the Greek and Arabic textual traditions. I argue that al-Fārābī's philosophical method should be regarded as a complex exegetical process whose main feature was the interpretation of Aristotle's theories in light of the late antique philosophical tradition, consisting of both commentaries on Aristotle and independent works. Various in-depth case studies of how al-Fārābī brought about this project are provided: his interpretation of Aristotle's unmoved movers, of celestial matter, and of the intellectual activity of the immaterial existents are a few striking examples discussed in the analysis. It is in this sense that one may speak of al-Fārābī's harmonizing project, which extended not only to the various currents of Greek philosophy, especially late antique Aristotelianism and Neoplatonism, but also included the works of ancient Greek astronomers, especially Ptolemy. The cosmological synthesis that emerged from his protracted engagement with these texts was due both to volitional and accidental factors, but it resulted in any case in the elaboration of a new cosmological paradigm that provided later thinkers with a framework for reconciling astronomy with physics and metaphysics.

This cosmological model may be seen as the culmination of a long intellectual development marked by several tensions, which are also discussed in the study. Indeed, al-Fārābī's exegetical approach was neither static nor monolithic, and it underwent various shifts in direction and perspective due to his dynamic understanding of the Greek works and factors emanating from his social and cultural environment. Accordingly, a central thesis articulated in this book is that al-Fārābī's cosmology underwent a clear evolution and can be divided into two distinct periods, which correspond to two different cosmological models or paradigms and to a rough chronology of his life and output. Through a discussion of the doctrinal and bio-bibliographic evidence, chapter 3 introduces a 'developmentalist hypothesis,' according to which al-Fārābī's cosmology shifted from a creationist position, which he upheld during his early Baghdad period, to an eternalist position that crystallized during a later phase of his life and coincides with the end of his stay in Baghdad and his travels to Syria and Egypt.

In addition to classifying and analyzing the evidence supporting this hypothesis, this study attempts to explain some of the social and religious factors that may have triggered this development and enabled al-Fārābī's mature cosmological theories to materialize. In conjunction with the examination of the Greek philosophical sources, the book contextualizes al-Fārābī's cosmology within the intellectual climate of his day, in order to reconstruct a more comprehensive picture of his intellectual trajectory and of his shifting philosophical priorities. The analysis focuses, among other issues, on his intellectual formation in Christian philosophical and theological circles in Baghdad, his likely familiarity with al-Kindī's (d. after 870 CE) and Abū Bakr al-Rāzī's (d. 925 CE) works and legacies, as well as his awareness of recent developments in Arabic science, especially Arabic astronomy. An approach that combines these cultural and biographical factors together with a study of the Greek sources can best explain the complexity of the Second Teacher's thought and the apparent discrepancies in his works.

In connecting al-Fārābī chiefly with the late antique Greek tradition of philosophical exegesis, this book builds on several scholarly contributions in Fārābīan studies, especially those of M. Maróth, C. D'Ancona, and P. Vallat, and is also indebted more broadly to studies on al-Fārābī's Neoplatonism, especially by T.-A. Druart.[4] Accordingly, this study focuses particularly on the Greek commentatorial tradition and especially the legacies of Alexander of Aphrodisias (fl. ca. 200 CE), Themistius (d. ca. 390 CE), Simplicius (d. ca. 560 CE), Philoponus (d. ca. 570 CE), and Proclus (d. 485 CE), whose works played a decisive role in shaping both the specific issues that al-Fārābī addressed in his cosmology and the solutions he elaborated. I devote a special place in the analysis to the Arabic translations and adaptations of Proclus' works, especially *Maḥḍ al-khayr*, the Arabic version of *Elements of Theology*, since this work was the likely medium through which al-Fārābī assimilated Proclean ideas. I attempt to explain how al-Fārābī used the *Proclus arabus* as a conceptual apparatus to construe Aristotle's cosmology in a new light and to articulate original solutions to old cosmological problems, as can be seen with respect to celestial substance, existence, and motion. Moreover, al-Fārābī's exegetical achievement and his complex theory of celestial causality and intellection define him as an exponent of certain key aspects of Neoplatonic

[4] Druart (1984a), Maróth (1994), D'Ancona (1995 and 2000), and Vallat (2004).

metaphysics in Islam and as an heir to the late antique pagan philosophical worldview. Consequently, al-Fārābī is presented throughout the analysis as an active and creative agent, rather than as a passive recipient, of the Greek philosophical heritage, and one who keenly adapted and transformed it to fit his own philosophical project.

In carrying out this source criticism, this study focuses on several texts from late antiquity and from within the Fārābīan corpus itself that have been either ignored or have not been the object of extended discussion in the secondary literature on al-Fārābī. This is the case, for instance, of several late antique physical and metaphysical commentaries, such as Alexander's and Simplicius' commentary on and paraphrase of *On the Heavens*, Themistius' paraphrase of *Metaphysics*, Geminus' astronomical works, Ptolemy's *Almagest* and *Planetary Hypotheses*, and Alexander's and Syrianus' commentaries on *Metaphysics*. I also devote much attention to the various texts forming the *Neoplatonica arabica*, which have seldom been the object of a detailed comparative analysis. In this connection, this study pays particular attention to the form in which al-Fārābī read these works, since the process of translating from Greek to Arabic was often accompanied by a fair amount of doctrinal adaptation, as can be seen with regard to the various Arabic versions of Aristotle's *Metaphysics* and the *Proclus arabus*. Illuminating al-Fārābī's interpretation of these works in the form in which he read them appears a necessary step to fully grasp the development of his cosmology.

With regard to al-Fārābī's corpus, the study focuses primarily on his main philosophical treatises, such as *Ārāʾ* and *Siyāsah*, but it also deals with understudied works such as *Mūsīqā* and *Burhān*, as well as many other logical treatises, which contain a wealth of information on al-Fārābī's scientific method and cosmological doctrines. In addition, both the main chapters of the book and appendix 1 include texts whose attribution to al-Fārābī remains uncertain. This is the case of *Taʿlīqāt*, *ʿUyūn*, *Ithbāt*, *Daʿāwā*, and more importantly of *Jamʿ* and *Jawābāt*, two works whose authorship has recently been questioned by M. Rashed.[5] An investigation of their cosmological contents is called for, both in order to settle their status vis-à-vis the Fārābīan corpus and to highlight the often interesting cosmological theories they formulate.

[5] M. Rashed (2008 and 2009).

The results accumulated throughout this study and the new developmentalist interpretation it articulates question previous ideas concerning al-Fārābī's philosophical affiliations and the structure of his corpus. In doing so, it participates in the ongoing debate concerning many aspects of al-Fārābī's thought and works and intends to offer new insight into these vexed issues. The present book challenges the view that the Fārābīan corpus can be divided neatly into 'Aristotelian' works and 'personal' or 'Neoplatonic' works, and it proposes a new division of the Fārābīan corpus in light of the developmentalist hypothesis. In this respect, the analysis also reassigns a new status to works that have recently been considered spurious or of doubtful authorship, and it discusses some of the reasons that can account for the discrepancies between these works and the rest of the Fārābīan corpus. Moreover, it provides an alternative explanation of al-Fārābī's use of the *Neoplatonica arabica* and of its place in his metaphysics, defining it as a key factor underlying the evolution of his thought. Finally, the study also redefines the much studied concept of emanationism in light of his general metaphysics of causation, thereby challenging the semantic specificity of this concept in his cosmology. In so doing, this book seeks to establish al-Fārābī's cosmology and his views on the question of the creation of the world firmly within the current scholarly discussion of these issues in Arabic intellectual history.[6]

Attaining these goals will provide an alternative to the interpretive paradigm of al-Fārābī's philosophy elaborated by M. Mahdi, which has until recently prevailed in Fārābīan studies. Although several monographs on al-Fārābī have appeared in recent years, they focus primarily on his political philosophy and perpetuate either explicitly or implicitly the Strauss-Mahdi paradigm, with the result that al-Fārābī's cosmology has still not received the thorough study it deserves.[7] As D. Gutas has

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[6] Several monographs focusing on cosmology and creation in the works of individual Arabic authors have been published recently; see for instance İskenderoğlu (2002), Acar (2005), Yousef (2008), and Griffel (2009). Al-Fārābī's place at the beginning of the Arabic philosophical tradition makes it all the more important to better understand his views on these topics.

[7] Notable examples are Galston (1990), Butterworth (in al-Fārābī 2001a), Colmo (2005), and Parens (2006). But the last decade has also witnessed the publication of several studies that either question the existence of a Fārābīan 'political philosophy' (Gutas 2002, 2003, and 2004b) or analyze it by avoiding Mahdi's interpretive paradigm and by connecting it with other aspects of al-Fārābī's thought; see Crone (2003 and 2004), Gannagé (2004), and especially Vallat (2004), whose book provides a new and compelling discussion of this topic in light of late antique philosophy. An original

written, "the prevalence of the Straussian interpretation of al-Fārābī has had a chilling effect on mainstream studies of this very significant philosopher."[8] To Mahdi's claim that al-Fārābī elaborated a "political cosmology" devoid of scientific value and designed to stand merely as a metaphor for the inhabitants of the virtuous city, this book argues that it should be regarded rather as a coherent worldview grounded in the most up-to-date physical, metaphysical, and astronomical theories of his time.[9]

Chapter 1 deals with al-Fārābī's methodology, which rests on a complex conceptualization of the scope and interrelatedness of the sciences. The central question that informs the discussion is an epistemological and methodological one: through which rational means and disciplines can human beings study the heavens and know the principles that govern them? Emphasis is placed on the method of astronomy, its relation to physics and metaphysics, the various techniques used for establishing its principles, the place of observation and experience, and the nature of the proofs associated with these sciences. In addition, the connection between al-Fārābī's logical and metaphysical treatises is also addressed, with the view of showing the interplay between these various facets of his thought.

Chapters 2 to 4 focus on some key doctrines of al-Fārābī's cosmology. Chapter 2 reconstructs the basic structure of his cosmological model and discusses the various physical and immaterial entities that constitute it. It provides an analysis of the Greek and Arabic sources al-Fārābī consulted and sheds light on his interpretive approach to these texts. In this respect, the study addresses specific cosmological questions that are crucial to understand the Second Teacher's cosmology, and by implication, the later history of Arabic cosmology. How did he interpret the Aristotelian theory of the unmoved movers in *Metaphysics* Book Lambda? How do these movers relate to the celestial orbs? What role does the principle of intellect play in his cosmology and what texts may have shaped his views on the subject? This chapter provides a clearer understanding of the place of Aristotelian and

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attempt to connect al-Fārābī's political theories with Ismaʿīlī ideas had also been made by Daiber (1991).

[8] Gutas (2002, 24); see also Gutas' (2003) review of Mahdi's book entitled *Alfarabi and the Foundation of Islamic Political Philosophy*.

[9] Mahdi (2001, 82, 121–122, 124).

Neoplatonic sources in al-Fārābī's cosmology and of how he interpreted them and used them to devise his own system.

Chapter 3 surveys and collects the disparate and fragmented evidence on celestial matter that can be found in al-Fārābī's corpus, with the aim of reconstructing his views on this important cosmological question. His views on celestial matter are furthermore contextualized within the debate about the creation of the world, raising the question of how God and the immaterial beings relate to the physical cosmos. The analysis focuses primarily on the concepts and terminology of causation articulated in the Second Teacher's works, particularly with respect to how they are applied to the various immaterial beings of his cosmology. Al-Fārābī's debt to Neoplatonic thought is emphasized through a comparative analysis of his works and the Greek and Arabic Proclus, enabling a more nuanced assessment of his affiliation to late antique metaphysics and of his attitude toward Islamic monotheism.

Finally, chapter 4 attempts to reconstruct the Second Teacher's theory of celestial motion on the basis of the rare passages dealing with this question in his works and by using evidence drawn from Ibn Sīnā's treatises. Particular attention is devoted to the role played by physics, metaphysics, and astronomy in al-Fārābī's explanations of how the orbs and planets move, to the question of kinematic causality, and to the relation between the separate intellects and the celestial orbs. This chapter provides insight into various key issues that should be of interest to those interested in the history of medieval kinematics.

The study therefore provides a detailed analysis of a cluster of concepts—celestial matter, intellection, causation, and motion—which constitute the building blocks of al-Fārābī's cosmological model and define him both as an heir and creative contributor to the cosmological legacy of late antiquity. On the other hand, it will not deal at any length with the much studied question of the nature and role of the Agent Intellect in al-Fārābī's philosophy, since technically speaking, the Agent Intellect is exclusively occupied with the sublunary world and plays no role in superlunary causation and motion. Little will be said about the related issues of how the Agent Intellect impacts on human intellection and on the epistemological connection between the human intellect and the heavenly world.[10]

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[10] For an analysis of this topic, see Davidson (1972 and 1992), Lucchetta (in al-Fārābī 1974), Geoffroy (2002), and Vallat ("L'intellect selon Fārābī: la transformation du savoir en être," forthcoming).

Given al-Fārābī's importance for the subsequent history of medieval thought, this study should be of interest to those dealing with Jewish, Christian, and Islamic cosmology and metaphysics. In addition, it provides a comparative analysis of Ibn Sīnā's and al-Fārābī's views on numerous themes. Hence, the results should also be of interest to students of Ibn Sīnā's philosophy and of the post-Avicennan philosophical tradition in Islam.

CHAPTER ONE

COSMOLOGY, THE SCIENCES, AND THE SCIENTIFIC METHOD

1. *The Late Antique Greek and Early Islamic Contexts*

Al-Fārābī's cosmology can be explained by the legacy of Greek science and philosophy on the one hand and the intellectual developments that characterized early Islamic civilization on the other.[1] With regard to the former, al-Fārābī inherited a dual cosmological tradition: an astronomical one embodied chiefly in the Ptolemaic works, as well as perhaps in some minor astronomical treatises by various Greek authors; and a philosophical one contained in the Aristotelian corpus and its commentaries, as well as the Arabic adaptations of Neoplatonic works, especially the *Proclus arabus* and *Plotinus arabus*. This duality is reflected in the Fārābīan corpus itself: while his commentary on *Almagest* was inscribed in an ancient astronomical tradition that endured until his time, his so-called 'emanationist' treatises, *Ārāʾ* and *Siyāsah*, cover a variety of physical, metaphysical, and political issues and are more in the vein of philosophical works such as Plato's *Timaeus* and *Republic*, Aristotle's *Metaphysics*, and Proclus' *Elements of Theology*.[2]

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[1] It should be stressed from the outset that al-Fārābī and medieval Arabic thinkers in general do not use a specific term to express our modern notion of 'cosmology.' Rather, as this study will show, their cosmology consisted of various disciplines, especially astronomy, physics, metaphysics, and sometimes astrology, whose relations vary from one system to another. It is insofar as these thinkers attempted to provide a systematic and rational interpretation of the cosmos using the various sciences available to them that one may legitimately speak of 'medieval cosmology.'

[2] Al-Fārābī's *Ārāʾ* and *Siyāsah* seem to possess a unique structure when compared to other works of the Greek and Arabic philosophical traditions, but as Maróth (1995, 105–106) and Genequand (in Alexander 2001, 21–22) have shown, they do share structural parallels with Alexander's *Mabādiʾ*. Rudolph (2008) has argued that their format can be fruitfully compared to contemporary *kalām* works. At any rate, these treatises are usually referred to as 'emanationist,' due to the so-called doctrine of emanationism they articulate. In spite of the ambiguity of this concept in al-Fārābī's metaphysics and the fact that I will question its specificity in a later section of this book (ch. 3, 2.6.), I decided to follow this common appellation for the sake of convenience, although I will also refer to them as the 'metaphysical' works. I have used Najjār's edition for *Siyāsah* (al-Fārābī 1964), as well as the English translation of the first section of

Hence, one may from the outset raise the questions of how al-Fārābī perceived this heritage, whether he attempted to achieve a reconciliation of these two disciplinary traditions, and how his corpus was adapted accordingly. In turn, this raises the question of the place occupied by astronomy, physics, and metaphysics in al-Fārābī's approach to cosmology. The degree of his acquaintance with contemporary astronomical research and his interest in scientific methodology are factors that should be taken into consideration. These questions will form the backdrop of chapter 1, but first I wish to say a few words concerning al-Fārābī's biography.

1.1. *Some Biographical Notes*

I will not provide a detailed account of al-Fārābī's biography in what follows, since very few facts about his life are known with certainty. Moreover, readers can now choose between two authoritative accounts, a skeptical and 'minimalist' article by D. Gutas, and a more elaborate yet speculative account by P. Vallat.[3] Rather, I will limit myself to highlighting a few aspects of al-Fārābī's life that can help us to better understand the formation and development of his philosophy. Abū Naṣr al-Fārābī was born in 870 CE, most likely in the district of Fārāb situated on the Jaxartes River (also known as Syr Darya) in Turkestan.[4]

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this work by McGinnis and Reisman (2007, 81–104). As for *Ārāʾ*, I have relied on both Walzer's (al-Fārābī 1985a) and Nādir's (al-Fārābī 1985b) editions. The former contains some lacunae and has been criticized (see Mahdi 1990a), but it occasionally provides a better reading than the latter. Unless otherwise stated, all English translations are taken from McGinnis and Reisman and Walzer.

[3] Gutas (1982a); Vallat (2004, 11–25). Legends and folklore, just as much as valid historical information, are the stuff of al-Fārābī's life, but Gutas has deftly sorted out these various threads and provided a solid critical account of the Second Teacher's career. I, for my part, prefer to adhere to this 'minimalist' account, except with respect to the issue of al-Fārābī's birthplace and to his intellectual formation with the Christian thinkers, two crucial points concerning which Vallat's arguments seem convincing and open several avenues for further research.

[4] As stated above, I follow Vallat and others on this point. The alternative place of birth, Fāryāb (or Fāriyāb), mentioned by Ibn al-Nadīm and apparently favored by Gutas (1982a, 210–211) in his critical evaluation of the biographical sources strikes me as less plausible. First, one may rightly assume that if al-Fārābī had been born in or hailed from Fāryāb, he would have been known as 'al-Fāryābī' and not as 'al-Fārābī,' the two names being written and pronounced differently in Arabic. But the Arabic tradition seems unanimous on this point. Second, one of the names attributed to al-Fārābī, 'ibn Ṭarkhān,' (sometimes in *nisbah* form 'al-Ṭarkhānī'), even by some of the early biographical sources, such as Ibn al-Nadīm, is clearly an Arabicized form of a Turkic name. Regardless of whether it refers to al-Fārābī's grandfather, as has been suggested,

Surprisingly, al-Fārābī's birthplace has never been properly discussed in scholarly works on this thinker, and so a few comments are in order. Far from being a cultural backwater, the broad regions of Khurāsān and Transoxania had been for centuries an arena of exchange and interaction between peoples of various linguistic and religious backgrounds, including pagans, Buddhists, Zoroastrians, and later Christians and Muslims. Hellenistic influences also reached these regions as a result of Alexander the Great's eastern campaigns and the establishment of Hellenistic kingdoms in Asia. Moreover, this vast geographic area entertained commercial and cultural contacts with the Turkic peoples and ultimately with China through land routes heading north. Fārāb itself, the district in which al-Fārābī was presumably born, was by no means negligible. According to al-Muqaddasī, who flourished in the tenth century CE, it consisted of several towns, including one, Fārāb (named after the district), which boasted fortifications, a communal mosque, markets, and a citadel, and was allegedly inhabited by some 70,000 people.[5] Even allowing for some exaggeration, this indicates that Fārāb was not an insignificant settlement. Al-Fārābī is said to have been born either in Fārāb itself or in the nearby village of Wasīj, but in either case his early years would have been spent in this cosmopolitan and culturally multi-faceted environment, a fact which can help to explain his later views on the relativity of religions vis-à-vis the universality of philosophy.

In view of this regional history and of the existence of urban centers in the heart of Fārāb, it is likely that al-Fārābī's philosophical formation began before his arrival in Baghdad. Apart from the district of Fārāb itself, there were several other cities in Transoxania and Khurāsān, which, by the late ninth and early tenth century, hosted a vibrant and diverse intellectual scene. Merw, for instance, possessed an important library and was a cultural center characterized by Christian, Islamic, and Hellenistic features. Several Christian thinkers, including al-Fārābī's teacher Yūḥannā ibn Ḥaylān (d. between 908-932 CE) and Ibrāhīm of Merw, the teacher of Abū Bishr Mattā ibn Yūnus (d. 940 CE), as well as

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or to another member of his family, it agrees with the previous point in suggesting al-Fārābī's Transoxanian origin, a not altogether surprising hypothesis given the number of thinkers active in Baghdad during the ninth and tenth centuries who originated from this region.

[5] Barthold [and Spuler] *EI*², Le Strange (1905, 484–485), and Barthold (1977, 176–9), who also provide the references to the Arabic geographic works.

the influential Barmakid family, hailed from this city.[6] Merw and Khurāsān in general were the home of a school of theology that produced several notable thinkers, such as Ibn al-Rāwandī (fl. 850 CE) and Abū l-Qāsim al-Kaʿbī al-Balkhī (d. 931 CE), whose writings may have been known to al-Fārābī.[7] Finally, Merw was the city from which the ʿAbbāsid revolution was launched, indicating its profound ideological and religious importance during this period. Thus, it seems plausible that al-Fārābī acquired the rudiments of his education in the cities of Transoxania and Khurāsān, even though it cannot be decided with certainty when and under which circumstances he first arrived in Baghdad.

Perhaps the most significant aspect of al-Fārābī's biography I wish to highlight here—and one about which we possess crucial evidence—is his early intellectual formation at the hands of Nestorian Christian thinkers. Although al-Fārābī's relation with the Nestorians is attested after his arrival in Baghdad, it is possible that he had been in contact with them prior to his arrival in the City of Peace, since the Nestorians had established a solid presence throughout the north-eastern Islamic lands, especially Merw. It is from this city—an important center of Nestorian thought and culture—that missionaries travelled to Central Asia and even China to spread their faith.[8] At any rate, al-Fārābī himself asserts that he studied logic with the Christian Yūḥannā ibn Ḥaylān, a report later confirmed by al-Masʿūdī, and he in addition probably attended some of the classes of Abū Bishr Mattā ibn Yūnus, another Nestorian thinker whom he surely met and whose translations of Aristotle he presumably read. Finally, it would seem that al-Fārābī also studied grammar with Ibn al-Sarrāj (d. 929 CE).[9] From what we can gather from this scarce biographical information, then, Yūḥannā ibn Ḥaylān and Abū Bishr Mattā ibn Yūnus are the two individuals who are likely to have had the strongest philosophical impact on the young

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[6] See al-Fārābī's autobiographic account, sometimes called *Fī ẓuhūr al-falsafah*, preserved by Ibn Abī Uṣaybiʿah (1965, 604); see also Zimmermann (1981, cv-cvi); and Landron (1994, 93). The interpretation of the historical data given by al-Fārābī concerning the transmission of ancient philosophy to the Middle East via the Syriac Christians has been debated by scholars; see notably Stroumsa (1991), Lameer (1997), Gutas (1999), and more recently Watt (2008).

[7] Van Ess (1980).

[8] Holmberg *EI²*.

[9] Ibn Abī Uṣaybiʿah (1965, 604) and Zimmermann (1981, cv ff.). The latter provides the most substantial discussion of al-Fārābī's relation to the Christian thinkers of his time.

al-Fārābī. For this reason, and because they will be frequently mentioned throughout this book, it is worthwhile to say more about these two figures.

Abū Bishr Mattā ibn Yūnus al-Qannāʾī, henceforth Mattā ibn Yūnus, was fluent in both Syriac and Arabic and was one of the outstanding representatives of the Christian Aristotelian circle in early tenth-century Baghdad. He studied first in the religious school of Mār Māri at Dayr Qunnā and then in the City of Peace with a group of scholars who allegedly had come from Merw. Apart from his debate with the Arabic grammarian Abū Saʿīd al-Sīrāfī, Mattā ibn Yūnus is chiefly known both for his numerous translations of Aristotle from Syriac and for his own commentaries on some of these Peripatetic works. It is perhaps not insignificant that Mattā ibn Yūnus chose to translate *Posterior Analytics* and *Metaphysics*, as well as other Aristotelian works dealing with the heavens and their impact on the sublunary world—part of *On the Heavens* and its paraphrase by Themistius, *On Generation and Corruption* with the commentaries of Alexander and Olympiodorus, and *Meteorology* with Olympiodorus' commentary—for these are precisely the works that shaped al-Fārābī's cosmological method and doctrines. This list of works points to the important place that cosmology occupied alongside logic in the circle that developed around Mattā ibn Yūnus, an interest that was apparently transmitted from teacher to disciple.[10]

Chiefly because his works have survived only in fragmentary state, if at all, but also because his debate with Abū Saʿīd al-Sīrāfī has monopolized the attention of scholars, Mattā ibn Yūnusʾ surviving writings have been hardly studied at all. This hampers any attempt to compare his theories to those of al-Fārābī. It also makes our understanding of how indebted the latter was to his teacher in the physical and metaphysical fields more difficult. While I already alluded to the common interest these philosophers shared in cosmology, it is likely that Mattā ibn Yūnusʾ influence on al-Fārābī extended to specific concepts and theories. For instance, some of Mattā ibn Yūnusʾ cosmological views on creation and causation, on the substance of the heavens, and on their impact on the sublunary world may have been instrumental in orienting al-Fārābī's early cosmological position. For this reason, one section

[10] See Endress *EI²* and Ferrari (2005). For the study of logic in the Syriac tradition and its relation to al-Fārābī, see Watt (2008).

of this book (ch. 3, 2.3.3.) will be devoted to analyzing the surviving excerpts of Mattā ibn Yūnusʾ commentary on *Physics* and exploring the potential influence his cosmological views had on al-Fārābī.

While we possess some valuable information concerning Mattā ibn Yūnusʾ life and works, virtually nothing is known about al-Fārābī's other official teacher, Yūḥannā b. Ḥaylān, who is described by al-Fārābī himself as his main instructor in logic. Even though some scholars have speculated that the two men studied in Ḥarrān, we possess virtually no evidence on the circumstances surrounding their encounter.[11] None of Ibn Ḥaylān's works has survived, and the biographical data that can be retrieved from the sources is meager and limited to a few scattered biographical remarks.[12] Yet when taken together, these facts concerning al-Fārābī's education at the hands of Christian thinkers are important and should be taken into account when assessing various aspects of his works and thought. They explain from the outset some of the striking features of al-Fārābī's output: its emphasis on logic and cosmology, its inclusion of numerous commentaries on Aristotle, and its concern about the relation between religion and philosophy. These elements will, on several occasions in this book, be brought to the fore of the discussion in an effort to combine a doctrinal and biographical analysis of al-Fārābī's philosophy.

The biographical sketch given above shows that al-Fārābī's interest in cosmology first developed as a result of his philosophical formation with the Christian Peripatetics, especially in connection with the composition of his own commentaries on the physical works of the Aristotelian corpus. It is to this aspect of his output and to the various kinds of Greek and Arabic sources that shaped al-Fārābī's cosmology that I presently wish to turn.

1.2. *The Dual Legacy of Greek Astronomy and Philosophy*

1.2.1. *Aristotle, the Late Antique Commentators, and al-Fārābīʾs Commentatorial Activity*

Like most medieval cosmologists, al-Fārābī relied primarily on Aristotle's *On the Heavens*, *Physics*, and *Metaphysics*, which had been

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[11] See Vallat (2004, 19 ff.). While tantalizing, this hypothesis requires additional evidence, especially given the semi-mythical status of Ḥarrān in the Arabic historiographic sources.

[12] Habby (1997) has assembled virtually all the known information on Ibn Ḥaylān.

translated into Arabic at least once before or during his lifetime.[13] These Aristotelian works provided medieval thinkers with a coherent and elaborate cosmological model, whose various theories, however, were not always easy to reconcile with one another. Many of the cosmological issues studied by al-Fārābī, such as the substance of the heavenly bodies, the organization of the heavenly orbs, their intellection and motion, and their relation to God, stem from these seminal works. But in many instances, he departs from Aristotle by developing his own interpretations, salient examples being his theories of heavenly matter, intellection, causation, and motion (discussed in ch. 2–4).

Apart from some of his propaedeutic works, such as *Iḥṣāʾ*, *Fī mā yanbaghī*, and *Falsafat Aristūṭālīs*, al-Fārābī's familiarity with the Aristotelian corpus can be gauged from his commentaries on the *Organon* and from the bibliographic information concerning his commentatorial activity. While his commentaries on or summaries of *Categories*, *On Interpretation*, *Topics*, *Prior Analytics*, *Posterior Analytics*, as well as on *Rhetoric*, are all extant, Ibn al-Qifṭī and Ibn Abī Uṣaybiʿah also mention other commentaries on *Physics*, *On the Heavens*, and *Meteorology*, which surely contained a wealth of information on al-Fārābī's cosmology, but which unfortunately have not survived, except for a short excerpt of *Physics* preserved in Latin.[14] On the other hand, al-Fārābī does not seem to have written a full commentary on *Metaphysics*, a somewhat surprising fact given the importance of Book Lambda in his cosmology.[15] Hence, in spite of the fact that virtually all of the commentaries al-Fārābī wrote on natural philosophy have vanished, the bio-bibliographic reports indicate that he assiduously studied the

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[13] For the translation and reception of these texts in Syriac and Arabic, see Peters (1968), Endress (1966, 1995, and 1997b), Martin (1989), Luna (1989), Bertolacci (2001 and 2005b), Hugonnard-Roche (2003), and Thillet (2003).

[14] Ibn al-Qifṭī (1903, 279–280), Ibn Abī Uṣaybiʿah (1965, 608–609); see also Ibn al-Nadīm (1970, vol. 2, 599–602, 629). For the surviving excerpt of al-Fārābī's commentary on Aristotle's *Physics*, see Birkenmajer (1935). This work appears to have been very influential and was frequently cited by later Arabic authors when they redacted their own *Physics* commentary; see Lettinck (1994, 260, 308–311, 315, 491, 602, 606, 614, 639, 644, 650).

[15] Still extant, however, is *Aghrāḍ*, which is not a commentary, but rather a brief summary of the aim of the various books of *Metaphysics*. See al-Fārābī (1999c) for the Arabic text, Druart (1982b) for a French translation, and McGinnis and Reisman (2007, 78–81) for an English translation. Ibn Sīnā reports in his autobiography that he could only grasp the true aim of *Metaphysics* after having chanced upon al-Fārābī's *Aghrāḍ*; see al-Bayhaqī (1935, 16), who reports the anecdote; and Gutas (1988, 240–242) and Bertolacci (2001 and 2005a) for the relevant excerpt and the impact this work had on Ibn Sīnā's metaphysics.

main works of the Aristotelian corpus, with a special emphasis on the *Organon* and on the physical treatises, many of which deal with the heavens and cosmological phenomena.

This emphasis on logic and cosmology can be explained convincingly by al-Fārābī's early philosophical training with the Christian Peripatetic thinkers, who on the one hand specialized in the study of the *Organon*, and on the other hand showed a marked interest for Aristotle's cosmology and translated many works dealing with this topic.[16] This highlights the continuity between the philosophical activity of Mattā ibn Yūnus and al-Fārābī and helps us to better understand some of the roots of his thought. That al-Fārābī quickly attained proficiency in this adapted curriculum and in the study of Aristotelian logic in particular is attested by the Arabic historiographical tradition, which describes him by the honorific title of 'Second Teacher' or 'Second Master.' This title at once shows the importance of his commentatorial works and his esteemed status as an interpreter of the Stagirite in the Arabic tradition, even though our knowledge of this aspect of his philosophy is in many ways fragmentary.[17]

Al-Fārābī's extant commentaries are valuable not only for their capacity to help us understand how he interpreted Aristotle, but also because they provide some insight into his philosophical method and the evolution of his thought. In this respect, and although little is known about the chronology of al-Fārābī's works, it may be assumed that he wrote most of his commentaries during an early phase of his life, when he was studying under Yūḥannā ibn Ḥaylān and possibly Mattā ibn Yūnus in Baghdad.[18] The practice of writing commentaries

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[16] For a detailed discussion of al-Fārābī's logical studies with the Christian Peripatetics, see Zimmermann ("Introduction," in al-Fārābī 1981a). The importance devoted to cosmology in al-Fārābī's works is clearly visible in his emanationist treatises, but it can also be perceived in his summary of Aristotle's philosophy entitled *Falsafat Arisṭūṭālīs*. This work quickly surveys crucial concepts of Aristotelian physics, such as time, but discusses in excessive detail the place and nature of the elements in the cosmos.

[17] It is well known that al-Fārābī's commentaries had a profound impact on subsequent thinkers, especially on those hailing from the Western part of the *dār al-Islām*. Ibn Bājjah, Ibn Rushd, and Maimonides made extensive use of the Fārābian commentaries in their cosmological, psychological, and logical writings, developing and criticizing some of his ideas in the process.

[18] Apart from the connection with these Christian scholars, themselves translators of and/or commentators on the Aristotelian corpus, this seems supported by the report in Ibn al-Nadīm's *Fihrist* (1970, vol. 2, 599–602, 629), which surprisingly mentions only al-Fārābī's commentaries and not his mature metaphysical works. It is noteworthy that

was very common in the Christian intellectual milieu he frequented in Baghdad and may be regarded as a continuation of the Alexandrian academic tradition, which had also devoted a privileged place to the writing of commentaries and to the study of logic in its philosophical curriculum. Yūḥannā ibn Ḥaylān and Yaḥyā ibn ʿAdī, a teacher and student of al-Fārābī respectively, were well-known translators of, and commentators on, the Aristotelian corpus and contributed actively to spreading Aristotelian philosophy to the Middle East.[19] Regardless of how much credibility should be ascribed to the traditional narrative concerning the transmission of the Alexandrian philosophical curriculum to Baghdad, it is undeniable that al-Fārābī's early philosophical phase is inscribed in a well-established tradition of commentatorial writing and studying that has its roots in late antiquity, but one of whose main offshoots flourished in Syriac circles in ninth- and tenth-century Baghdad.

The historical context sketched above represents the first hint that al-Fārābī's philosophical initiation and his interpretation of Aristotle were shaped by some of the social, cultural, and intellectual circumstances prevailing in the Baghdad of his time. In turn, this indicates that al-Fārābī's approach to philosophy may have evolved throughout his career, as he gradually distanced himself from this early philosophical framework characterized mainly by the study of Aristotle and the writing of commentaries. Research on al-Fārābī's logical works, such as *K. al-qiyās* and *K. mudkhal ilā l-qiyās*, *K. al-ʿibārah*, and *K. al-khaṭābah* (works based on *Prior Analytics, On Interpretation*, and *Rhetoric* respectively), has shown that from the very outset, he did not slavishly follow Aristotelian logic in an uncritical way, but rather developed his own theories and elaborated on several concepts merely alluded to in the original Greek texts.[20] As this book will show, the same may be said

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Ibn al-Nadīm was active shortly after al-Fārābī's death and may even have been a younger contemporary of the philosopher for a few years in Baghdad. Since al-Fārābī presumably wrote most of his commentaries during his early Baghdad phase, these are the works that Ibn al-Nadīm would have primarily known and to which he would have had easy access. On the other hand, and as will be argued later on, the emanationist treatises were presumably written during the end of al-Fārābī's stay in Baghdad, as well as during his sojourn in Syria and Egypt, which might explain why they are not mentioned in *Fihrist*.

[19] For Yaḥyā ibn ʿAdī's activity as a commentator, see Endress (1977) and Kraemer (1992, 108 ff.).

[20] For *K. al-qiyās*, see al-Fārābī (1963 and 1985c), Gyekye (1972), and Lameer (1994); for *ʿIbārah*, see Zimmermann's analysis (in al-Fārābī 1981a), and Black (2006); for *Khaṭābah*, see al-Fārābī (1971a), Black (1990), and Aouad (1992).

about al-Fārābī's cosmological theories. By way of illustration, according to Maimonides in *Guide*, al-Fārābī's *Physics* commentary argued that different degrees of celestial matter should be ascribed to the different types of celestial bodies in the heavens. This view not only marks an elaboration on Aristotle's aether theory as it is exposed in *On the Heavens*, but also differs from al-Fārābī's own doctrine of celestial substance as it appears in his other works, especially in his metaphysical treatises.[21] This simple fact suggests that al-Fārābī's no longer extant commentaries on *On the Heavens* and *Physics* may have already initiated a process of transformation of Aristotle's cosmology, thus pointing to a creative approach to these cosmological problems early in al-Fārābī's life. It also raises the possibility (explored in detail in chapter 3 of this book) that the views articulated in the presumably early commentatorial works such as *Physics* and *On the Heavens* were later abandoned by al-Fārābī when he wrote his mature philosophical treatises.

Needless to say, the loss of al-Fārābī's commentaries on *Physics*, *On the Heavens*, and *Meteorology* represents a tremendous impediment for our understanding of his cosmology. The loss of *On the Heavens* is particularly acute due to the place that this work traditionally occupies in the cosmological systems of ancient and medieval thinkers. This is all the more true in the case of al-Fārābī, who appears to have elaborated a new cosmological model in *Ārāʾ* and *Siyāsah* that had a lasting influence on subsequent thinkers.[22] The disappearance of al-Fārābī's commentaries on *Physics* and *On the Heavens* also renders an assessment of his relation to the ancient commentators more difficult. It was customary for Greek exegetes to discuss the views of previous or contemporary authors in their own account of Aristotle's works. *On the Heavens* in particular was one of the most debated texts and became a locus of scholarly contention in the late antique period. The Greek philosopher Simplicius offers a good example of this practice: a wealth of information about other thinkers (e.g., Alexander of Aphrodisias, Ammonius son of Hermeias, and Philoponus) can be extracted from

[21] Maimonides (1963, vol. 2, 309); see chapter 3 for a fuller discussion of this passage and celestial matter.

[22] Ibn Sīnā and Ḥamīd al-Dīn al-Kirmānī, to name but two thinkers, adopted some of the key features of al-Fārābī's cosmology. Although they considerably modified al-Fārābī's scheme, their model of a heaven divided into nine sections each associated with one or several separate intellects is directly indebted to the philosophy of the Second Teacher. For al-Kirmānī, see De Smet (1995, 282–284, 380; 2007, 488, and note 33; and 2008). I will say more about Ibn Sīnā's cosmology later on.

his commentary on this work. But because al-Fārābī's commentaries on the Aristotelian physical treatises have vanished, we have only limited information about his exegetical method and the degree of his reliance on the late antique Greek commentators. This problem is compounded by the fact that he is usually reluctant to mention previous thinkers by name and to acknowledge the debt he owes them, which makes it difficult to gauge the originality of his thought.[23]

In spite of this, the bio-bibliographic sources ascertain that al-Fārābī could have read several late antique Greek commentaries on logic, natural philosophy, and metaphysics in addition to the Aristotelian works. Most of these commentaries were translated into Arabic either before or during al-Fārābī's life and had become part and parcel of the philosophical education of his day. For instance, he may have consulted all or part of Alexander's and Philoponus' commentaries on *Physics*, Alexander's commentary on *On the Heavens* and on some chapters of *Metaphysics*, as well as Themistius' paraphrases of the two latter works. This information is crucial to understand al-Fārābī's cosmology, which often builds upon the theories that these thinkers articulated in their attempt to tie up the loose ends in Aristotle's thought and legacy. When one realizes that Mattā ibn Yūnus and Yaḥyā ibn ʿAdī, who belonged to the same Baghdadi circle as al-Fārābī, figure prominently among the translators of these Greek commentaries, then the connection between al-Fārābī and the late antique authors acquires a new significance.

Finally, and as a complement to Aristotle and the late antique commentaries, al-Fārābī read Arabic recensions or adaptations of Neoplatonic works, although he did not write commentaries on them.[24]

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[23] Chapter 3 will argue that al-Fārābī's doctrine of celestial matter in his emanationist works owes an unquestionable debt to the cosmology of Alexander of Aphrodisias and Themistius; yet their names are not mentioned directly. This need hardly surprise us, since al-Fārābī rarely refers to other thinkers by name, except in those works which are meant to summarize the doctrine of a particular philosopher, such as *Falsafat Aflāṭūn* and *Falsafat Arisṭūṭālīs*.

[24] The Neoplatonic texts translated and adapted into Arabic are collectively known as *Neoplatonica arabica* and consist chiefly of the *Plotinus arabus* (itself composed of *Theology of Aristotle*, the *Sayings of the Greek Sage*, and *Epistle on Divine Science* spuriously attributed to al-Fārābī) and the *Proclus arabus*, mostly known through adaptations of Proclus' *Elements of Theology*. For the *Plotinus arabus*, see Badawī (1977b), Aouad (1989), and Adamson (2002a). The present study will focus especially on the Arabic versions of Proclus' *Elements*, which survived in Arabic in different forms: the excerpts assembled and studied by Endress (1973) (to these must be added an additional excerpt identified by Zimmermann 1994); the *Liber de causis*, known in Arabic as *Kalām fī maḥḍ al-khayr*, which was edited by Badawī (1977a), and analyzed and

Although little is known about the context in which these works were studied—they do not seem to have occupied a central place in the curriculum of al-Fārābī's Christian teachers—they nonetheless played a vital role in shaping some of his cosmological and metaphysical doctrines.[25] These works devote much attention to the cosmic principles of soul and intellect and their various effects, the nature of the stars, the influence of the celestial bodies on the sublunary world, not to mention the many excerpts that discuss creation and causality. That al-Fārābī knew this corpus well, especially the *Proclus arabus*, and integrated several of its theories into his own cosmological model will represent one of the main results of the source analysis provided in this book. As chapters 2 and 3 will show, nowhere is this Neoplatonic dimension more explicitly and forcefully expressed than in al-Fārābī's conception of the activity and causation of the intellectual substances and of how God relates to the world. As a result, his theories sometimes depart significantly from Aristotle's doctrine. What remains to be clarified, however, is whether he genuinely ascribed these works to Aristotle or did so only for apologetic reasons, and the degree to which the corpus he consulted differs from the recensions now in our possession. The foregoing remarks aimed to delineate the late antique philosophical sources that al-Fārābī could have read and used to elaborate his cosmology. To complete this picture, it is necessary to say a few words about al-Fārābī's reception of the Greek astronomical sources.

1.2.2. *Did al-Fārābī Write a Commentary on Ptolemy's Almagest?*

In addition to his various commentaries on Aristotle, al-Fārābī is credited by the bio-bibliographers with a commentary on Ptolemy's

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translated into English by Taylor (1981); and finally *Liber de causis II*, edited by Thillet and Oudaimah (2001–2002), which is another version of *Maḥḍ al-khayr* and which presents several divergences from its better known homonym. *Maḥḍ al-khayr* and *Liber II*, which consist of 31 and 29 propositions respectively as opposed to Proclus' original 211, deal mostly with the structure of the intelligible world and the relation between the One and the other intelligible entities. The most comprehensive studies of these Proclean texts are to be found in Taylor (1981 and 1986), D'Ancona (1995), and D'Ancona and Taylor (2003).

[25] Al-Fārābī's relation to Neoplatonism has been widely discussed and debated in the scholarly literature. See notably the studies by Galston (1977), Ivry (1990), Druart (1987a and 1992), and more recently Vallat (2004). In spite of this, few detailed comparative analyses of the terminology and concepts in al-Fārābī's writings and in the *Neoplatonica arabica* have been conducted. For recent attempts, see Vallat (2004 and id., "Al-Farabi's arguments for the Eternity of the World," forthcoming), and Janos (2010a).

Almagest.[26] Al-Fārābī had direct access to Ptolemy's main astronomical works, as both *Almagest* and *Planetary Hypotheses* were translated into Arabic during the ninth century.[27] The impact of these Ptolemaic works can be felt throughout his corpus. The arrangement and order of the planets as described by al-Fārābī, his views on the various motions of the orbs, and his endorsement of the epicycles and eccentrics are all Ptolemaic elements that he integrates in his cosmology. In addition to these foundational Ptolemaic writings, it is possible that al-Fārābī also had access to more minor Greek astronomical works (such as parts of Aratus' poem), as well as excerpts from Geminus' (fl. first century CE) *Introduction to the Phenomena*, and Simplicius' commentary on *On the Heavens*, two works which contain significant passages on the astronomical method.[28] In any case al-Fārābī's knowledge of ancient Greek astronomy was substantial enough for him to write about its method and to take its findings into account when elaborating his own cosmology.

The question of whether al-Fārābī truly penned a commentary (*sharḥ*) on Ptolemy's *Almagest* is important, since it has a direct bearing on the proper understanding of his cosmology. Yet it is also a complicated one that has generated much confusion. In what follows, I describe chronologically the various stages in the history of this puzzle. According to the medieval bio-bibliographers, the Second Teacher wrote a commentary on *Almagest* as part of his mathematical output, which both al-Qifṭī and Ibn Abī Uṣaybiʿah mention under the title *Sharḥ kitāb al-majisṭī*, although al-Fārābī himself never refers to it in

[26] See al-Qifṭī (1903, 279,17–18) and Ibn Abī Uṣaybiʿah (1965, 608).

[27] For the Arabic translations of *Almagest*, see Ibn al-Nadīm (1970, vol. 2, 639) and Toomer (1984, 2). No edition of the entire Arabic version of *Planetary Hypotheses* exists to this day. Throughout this book, I relied on the reproduction of the Arabic manuscript by Goldstein (1967), the complete Spanish translation executed by García Blanco and Cano Ledesma (Ptolemy 1987), and Morelon's (1993) French translation of Book One. Saliba (2007, ch. 1–3) provides a detailed discussion of the cultural and social circumstances surrounding the translation of the Greek astronomical works into Arabic and especially the reception of Ptolemy's works in the Islamic astronomical circles. In the case of *Hypotheses*, there is no direct evidence that al-Fārābī knew or read this work, although it would be surprising if he ignored its existence, since it was known to earlier and contemporary astronomers. Chapter 4 will show that *Hypotheses* underlies some crucial points of his theory of celestial kinematics.

[28] For the Arabic fragments of Aratus, see Honigmann (1950). Geminus' *Introduction to the Phenomena* and Simplicius' commentary on *On the Heavens* are not mentioned by the bio-bibliographers in their surveys of the Arabic translations, although it is possible that some excerpts of these works were known to Arabic thinkers.

his extant works. Two manuscripts—one in the British Library in London and the other in the Majlis Library in Tehran—bearing this title and attributed to al-Fārābī were listed by Sezgin in *GAS* and by Rosenfeld and İhsanoğlu in their prosopographic study of Arabic astronomers.[29] The first attempt to study this work systematically was made by a team of Soviet scholars in the 1970s, which provided a Russian translation of the British Library manuscript, together with a substantial introduction and endnotes.[30] But it was shown subsequently by B. Goldstein that the British Library manuscript, which Kubesova et al. claim to be the only surviving copy of al-Fārābī's *Sharḥ*, should in fact be attributed to Ibn Sīnā.[31] Following Goldstein, I myself can attest that although al-Fārābī's name is mentioned on two occasions in the first folios of this manuscript, a comparison of its structure and contents with Ibn Sīnā's *Taḥrīr al-majisṭī* as published in the mathematical section of *Shifāʾ* indicates that we are essentially dealing with two versions of the same text.[32]

Furthermore, and to add yet more confusion to this state of affairs, my attempt to obtain a copy of the Majlis Library manuscript proved unsuccessful, as the staff could not find or even identify the alleged

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[29] Brockelmann (1996, vol. 1, 234) only mentions the British Library manuscript; Sezgin (1967-, vol. 5, 195) and Rosenfeld and İhsanoğlu (2003, 76). Following a convention in Greco-Arabic studies, I use the term 'Arabic' to describe those scholars who wrote most or all of their philosophical and/or scientific works in Arabic, regardless of their ethnic and religious background. The term therefore refers to the Arabic language, which was the prevalent means of communication shared by Muslims, Jews, and Christians alike.

[30] Kubesov et al. (1975). Soviet scholars working during the 1970s and 1980s, especially A. Kubesov and B. A. Rosenfeld, published extensively on al-Fārābī's mathematical treatises and on Arabic mathematics in general. Because of the language barrier, these studies have rarely been integrated into Western scholarship. With regard to al-Fārābī's views on astronomy, however, Kubesov's studies (1974, 1981) are problematic, in that they rely extensively on the British Library manuscript. Moreover, the authenticity of many of the treatises he discusses has to be more firmly established before his conclusions can be fully accepted. In spite of this, Kubesov must be given credit for being one of the only scholars to focus on the astronomical theories of the *falāsifah*.

[31] Goldstein (1980, 342).

[32] Judging from their comments, it appears that Kubesov et al. were not cognizant of the existence of the Majlis Libary manuscript, which was first mentioned by Sezgin. More unsettling is the fact that their Russian rendition of the opening section of the commentary does not exactly match the text of the British Library manuscript. For example, the name al-Fārābī is nowhere to be found in their Russian translation, although it appears on numerous occasions in the British Library copy. This indicates either that Kubesov et al. adumbrated the text at their disposal or that they did not after all consult exactly the same document as the one owned by the British Library.

manuscript. While I despaired for some time thinking that no exemplar of Fārābī's commentary had survived, I was informed recently and incidentally that a microfilm copy of the Majlis Library manuscript was made and preserved in the Al-Asad Library in Damascus. Unfortunately, I was not able to consult the Al-Asad Library microfilm in time to include its contents in my study, nor was I even able to ascertain its authenticity. Given the unpredictable history associated with al-Fārābī's commentary, it should be confirmed first, that the Al-Asad copy is indeed a commentary on Ptolemy's *Almagest*, and second, that it is by al-Fārābī himself and does not consist in another misattribution. In any case, with one manuscript re-attributed and the other one vanishing, the Al-Asad copy represents for the time being the only hope to retrieve al-Fārābī's putative commentary from obscurity. I can only wish that research on this text be carried out in the near future, be it only to settle a very confusing issue.

The foregoing considerations raise the following question: given the still complete absence of positive manuscript evidence, can a commentary on *Almagest* still be securely attributed to al-Fārābī? This question is even more pressing when one realizes that the reports of the Arabic bio-bibliographers are often dubious. Although no definitive answer can be put forward at this point in time, there does not seem to be any *a priori* reason to reject the authenticity of this attribution. As the examples of Ibn Sīnā and Naṣīr al-Dīn al-Ṭūsī show, it was common for medieval Arabic philosophers to practice astronomy and to summarize or comment on Ptolemy's *Almagest*. Moreover, part of al-Fārābī's commentary was apparently criticized by a later scholar interested in astronomy.[33] Hence, in the absence of any decisive evidence pointing to the contrary, it should be assumed with some caution that al-Fārābī was indeed the author of such a commentary.

Several points concerning al-Fārābī's astronomical activity may be inferred from his composing a commentary on *Almagest*. First, although he dedicated himself primarily to other sectors of philosophy such as metaphysics and logic, he was sufficiently interested in astronomy to write an entire treatise on Ptolemy's *Almagest*. In that sense, al-Fārābī was continuing a late antique tradition that harkens back to scholars such as Theon of Alexandria (d. ca. 405 CE), as well as Proclus'

[33] A certain Abū l-Fatḥ Aḥmad ibn Muḥammad ibn al-Sarī (d. 1153 CE) wrote a treatise entitled *Qawl fī bayān mā wahama fīhi Abū Naṣr al-Fārābī ʿinda sharḥihī l-faṣl al-sābiʿ ʿashar min al-maqālah al-khāmisah min al-majisṭī wa-sharḥ hādhā l-faṣl*, as reported by Sezgin in *GAS* (1967-, vol. 5, 195).

Hypotyposis and Simplicius' commentary on *On the Heavens* (two works that contain numerous digressions on Ptolemaic astronomy) and, in the early Islamic period, also includes al-Kindī.[34] All of these thinkers have in common the fact that they took Ptolemaic astronomy into account when redacting their cosmological works, either to criticize and ultimately reject it (as did Proclus) or to assimilate some of its theories (as did al-Kindī and al-Fārābī). Second, it indicates that al-Fārābī was cognizant of the various planetary theories devised by Ptolemy to explain the celestial phenomena, as well as with the technical terminology used in such queries. In fact, astronomical terms such as 'epicycles' (*aflāk al-tadwīr*) occasionally appear in al-Fārābī's philosophical treatises, thus proving that he had read technical works on the subject.[35] In brief, then, it would seem that the Second Teacher entertained a genuine interest in mathematical astronomy, even though little evidence on this aspect of his work has survived.

This being said, it is difficult to define the exact nature of al-Fārābī's astronomical activity. Did he limit himself to writing a commentary on *Almagest*, or did he, like Ibn Sīnā, carry out observations and collect astronomical data? Al-Fārābī's remarks in *Mūsīqā* on the value of observation and experience in astronomy and on the relation between scientific theory and practice indicate that his astronomical interest may have included a practical dimension.[36] This is also supported biographically by his protracted stay in Baghdad, a vibrant center for astronomical research during the ninth and tenth centuries.[37] The available evidence nevertheless does not allow us to confirm this hypothesis.

1.3. *Early Islamic Cosmological Trends*

Al-Fārābī's cosmological theories should also be contextualized in terms of the religious, philosophical, and scientific activity that developed during the first centuries of Islam. In this regard at least three

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[34] Rosenthal (1956), Rescher (1964, 45), and Adamson (2007a, 8).

[35] See for example *Ārāʾ* (al-Fārābī 1985a, 129 and 1985b, 73).

[36] See further section 2.2.1 below.

[37] Although there is no solid evidence for the existence of permanent and full-fledged observatories in ninth- and tenth-century Baghdad, we know that astronomical observations were carried out in this city, some of which were sponsored by the ʿAbbāsid caliphs, especially al-Maʾmūn; see Sayılı (1981, 51–80) and King (1997, 130–131).

important elements come into play: traditional Islamic cosmology, the philosophical precedents of al-Kindī and Abū Bakr al-Rāzī, and the development of an Arabic astronomical tradition.

1.3.1. *Traditional Islamic Cosmology and Early kalām*

The first Islamic centuries witnessed the emergence of a traditional cosmology that has its roots in various passages of the Qurʾān and in some *ḥadīth*s. This 'Qurʾānic' or 'traditionalist' cosmological model quickly became widespread in Islamic society, due to the exalted status of these texts in Muslim worship and scholarship. It also gradually infiltrated other Arabic literary genres such as poetry, creeds, *tafsīr*, *sīrah*, and *miʿrāj* accounts. Briefly, it presents the universe as consisting of seven superimposed earths and heavens, with God's throne (*ʿarsh*) and footstool (*kursī*) occupying the space above it.[38] There is some ambiguity concerning the shape of these seven heavens, which could be either domed or complete orbs surrounding the earth, depending on one's interpretation of the relevant verses. The celestial bodies, i.e., the sun, moon, and stars, occupy the space of the lowest heaven and move through the firmament by gliding in their orbits, while celestial oceans or rivers encircle the entire structure. As for the earth, it is presumably flat and is compared to a carpet that has been spread by God. Finally, it is important to stress that all of these heavenly entities were created by God for the welfare and benefit of human beings and to help them perform their various daily tasks and activities.[39] This model (Figure 1), which assumed the role of a paradigm for many Muslim theologians and traditionalists, endured well into the early modern period, as can be seen in the works of the fifteenth-century author al-Suyūṭī.[40]

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[38] See, for instance, verses 2:29, 17:44, 23:86, and 65:12: "It is God Who created seven heavens, and of earths their like."

[39] For a clear and concise overview of this traditional model, see Neuwirth (2001).

[40] Al-Suyūṭī's main work on traditional cosmology, *Al-hayʾah al-saniyyah fī l-hayʾah al-sunniyyah*, was extensively studied by Heinen (1982). Al-Suyūṭī relied on many earlier such works to write his book. This indicates an uninterrupted Islamic cosmological tradition running possibly from the formation of the Qurʾān and *ḥadīth* literature—or shortly thereafter—to the fifteenth century. However, this traditional model also underwent substantial transformation as a result of its contact with the Ptolemaic worldview. In some *kalām* works, for instance, the throne and footstool are identified with the eighth and ninth celestial orbs of the Ptolemaic universe, although it is unclear when exactly this exegetical trend began; see Heinen (1982, 76 ff.) and Huart *EI*[2].

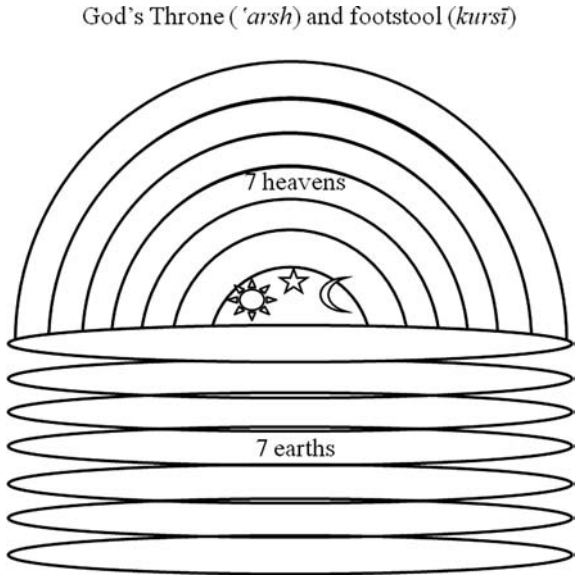

Figure 1: The Qurʾānic cosmological model consisting of the seven heavens and earths

A quick comparison between al-Fārābī's cosmology and this Qurʾānic model enables one to perceive the gap that separates them and the very different sources and traditions from which they stem. While the Qurʾānic model is indebted to previous Biblical sources and ultimately to ancient Mesopotamian culture and religion, the roots of al-Fārābī's model, in contrast, can be traced back to the Greek philosophical and scientific traditions of late antiquity.[41] In addition, and contrary to many other Arabic thinkers, one does not perceive in his works any effort to reconcile the Ptolemaic worldview with the Qurʾānic scheme of seven earths and seven heavens and with Islamic cosmology in general.[42] On the contrary, some of al-Fārābī's theories, such as the ensoulment of the heavenly bodies, the eternity of celestial motion, and

[41] For insight into this Biblical cosmological tradition and its Mesopotamian roots, see Collins (1996) and Horowitz (1998).

[42] One striking exception is the equation al-Fārābī makes between the separate intellects and the angels of the Islamic tradition (al-Fārābī 1964, 32). But this almost incidental identification is not developed at any length in the rest of the work and does not reflect a systematic attempt to adapt philosophical cosmology to an 'Islamic' template.

the causation of the separate intellects, are not compatible with the traditional Islamic understanding of the universe and of God's relation to His creation.

Although al-Fārābī shows no interest for the Qurʾānic cosmological model, one should not conclude that the Islamic theological tradition was not instrumental in shaping some aspects of his cosmology, be it only in reaction to it. Indeed, the model outlined above seems to have been prevalent in traditionalist Muslim circles and not among the theological groups that assimilated some aspects of Greek philosophy, especially the Muʿtazilites and some Ashʿarites. Although little is known about the early cosmology of these theologians, S. Pines, H. A. Wolfson, and A. Dhanani have shown that *kalām* was already actively engaged in physical and cosmological pursuits during al-Fārābī's life and that the Muslim theologians debated among themselves and against the philosophers about various physical issues.[43] It is therefore not unreasonable to surmise that al-Fārābī was cognizant of these theologians' position on important topics such as the creation of the universe, atomism and the nature of celestial matter, as well as the ontological status of the celestial bodies, even though it is objectively difficult to establish concrete links and textual parallels between these thinkers. In this connection, U. Rudolph has in two recent papers argued that al-Fārābī was aware of some of the debates taking place in the theological circles of his day and that there is a structural overlap between his treatises and contemporary theological works.[44] As J. van Ess argued some time earlier, it is possible that he intended to refute the views of individual theologians hailing from Khurāsān, notably Ibn al-Rāwandī and Abū l-Qāsim al-Balkhī.[45] Indeed, the doctrines of these Khurāsānī theologians had spread to a geographic area comparatively closer to al-Fārābī's homeland than to the ʿAbbāsid capital.[46]

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[43] Pines (1936), Wolfson (1976), and Dhanani (1994).

[44] Rudolph (2007 and 2008).

[45] Van Ess (1980). Ibn al-Qifṭī (1903, 279) mentions a *Kitāb al-radd ʿalā l-Rāwandī* as one of al-Fārābī's compositions.

[46] In spite of the foregoing, it is difficult to identify the theologians whom al-Fārābī addresses in his writings, since he does not name individual thinkers and since his remarks usually remain quite general. Al-Fārābī in many cases adopts an ambiguous position vis-à-vis the theological camp, endorsing some aspects of their method but condemning others. For instance, his reliance on analogical tools and his obvious interest in the political and didactic potential of rhetoric and dialectic, which he shares with the theologians, point to complicated interactions between him and the various

In addition to the Muslim *mutakallimūn*, it is possible that the doctrines of the Christian theologians inspired some of al-Fārābī's ideas with regard to cosmogony. Al-Fārābī's formative years, spent in the company of the Baghdad Christian commentators and philosophers, not only influenced his understanding of Aristotle, but may also have been decisive in shaping some of his views on the question of the creation of the world. It is well known that al-Fārābī in *Jamʿ* attributes a creationist position to Aristotle, a view which may also be defended in some of his other treatises. Assuming for the time being that these writings are authentic, can the view they put forth be attributed to the influence of theological ideas on al-Fārābī's early intellectual formation? While this question will be discussed in detail in chapter 3, suffice it to say here that the dialectic between the doctrines of the philosophers and those of the Christian and Muslim theologians is an important element of the early history of Arabic thought and should be borne in mind when analyzing the works of the *falāsifah*.[47]

1.3.2. *Early Arabic Philosophical Precedents*

The role of previous Arabic philosophers, especially al-Kindī and Abū Bakr al-Rāzī, in shaping the approach and content of the Second Teacher's cosmology represents another important aspect of the problem. They were the two most outstanding figures of the pre-Fārābīan Arabic philosophical tradition and had already elaborated complex cosmologies, which, like al-Fārābī's, assimilated Greek ideas and theories to address the theological and philosophical problems of their day. Al-Kindī plays a particularly important role in our story, for to our knowledge he is the first Arabic philosopher to develop a full-fledged cosmological model that relies on a substantial amount of astronomical data and to show some interest for this science. Al-Kindī wrote extensively on cosmology and was particularly interested in astronomy and astrology, as his numerous writings on these subjects testify.[48] Like al-Fārābī, al-Kindī is said to have commented on *Almagest*, and again like al-Fārābī, he integrates a large share of astronomical, and

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theological groups of his day. These interactions would have been at any rate unavoidable in the vibrant intellectual centers that were Baghdad and the major cities of Khurāsān at this epoch.

[47] For an illustration of this dialectic in al-Kindī's works, see Adamson (2003), and in al-Fārābī's works, Rudolph (2007 and 2008).

[48] Al-Kindī (1950–53 and 1997); al-Kindī's treatises on these subjects are listed by Ibn al-Nadīm (1970, vol. 2, 615–622). See also Adamson (2008, passim).

more specifically Ptolemaic, material in his treatises. Furthermore, he attempted a systematic reconciliation of Ptolemaic astronomy and Aristotelian and Neoplatonic physical and metaphysical theories.[49] This philosophical approach is also pursued with utmost dedication by al-Fārābī in his own cosmological works, although it is unclear in his case whether he knew the true origin of the Arabic Neoplatonic texts he read.[50] Finally, key to both of these two thinkers' cosmologies were the *Neoplatonica arabica*, which significantly shaped their interpretation of Aristotle and also provided important concepts that were used as starting points for independent elaborations.

Al-Kindī may be said to have anticipated some important features of al-Fārābī's and Ibn Sīnā's cosmological projects. He was perhaps the first to address some of the challenges and problems that these thinkers dealt with, such as the place of astronomy and astrology in philosophy. As I will argue in chapter 3, al-Kindī may also have exercised a profound doctrinal influence on al-Fārābī's early years, especially with regard to the cosmological model al-Fārābī adhered to during his studies with the Christian thinkers in Baghdad. Although the impact of the works emerging from the al-Kindī circle may not have had a profound impact on the Christian Peripatetics (judging from what remains of their corpora), it conversely played a decisive role in the case of al-Fārābī's philosophy.[51] One example of al-Kindī's potential influence

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[49] As Adamson (2007a, 29, 37, 46, and 112) notes, al-Kindī perceived Aristotelianism and Neoplatonism as compatible systems, and he strove to harmonize their various doctrines into a new synthesis. This project was facilitated by the translations and compilations of Neoplatonic material in Arabic executed in the al-Kindī circle; see Adamson (2002a), D'Ancona (2003, 84, 88–90); and D'Ancona and Taylor (2003, 627–628). It is however unclear to what extent these translations were informed by the idea of philosophical harmonization or, conversely, to what extent the latter idea emerged as a result of these translations.

[50] There has been long scholarly disagreement on this question. It was the view of some of the first historians of Arabic philosophy that al-Fārābī was ignorant of the true provenance of these Arabic Neoplatonic works (see for instance B. Carra de Vaux, *E. J. Brill's First Encyclopaedia of Islam*, vol. 3, 53–55). In the last decades, various scholars, especially M. Mahdi, M. Galston, and C. Butterworth, have contested this view as part of an attempt to define al-Fārābī chiefly as an Aristotelian philosopher, who relied on the Arabic Neoplatonic texts with full cognizance of their spuriousness and for apologetic or ideological reasons. As I try to show in this book, this thesis is in many respects unconvincing, and I believe that al-Fārābī's understanding of Aristotelian metaphysics was shaped both by original works from the Stagirite and by the *Neoplatonica arabica*. For a detailed treatment of these issues, see chapter 3.

[51] In this regard, Adamson's remarks (2007, 15) that the Arabic Neoplatonic works were "of little import" for the Baghdad School, including al-Fārābī, and that "the Baghdad school … were not much influenced by Plotinus and Proclus"

pertains to al-Fārābī's early theory of celestial matter and its relation to the creation of the world, which may be directly indebted to al-Kindī. Al-Fārābī's discovery of al-Kindī's philosophy may have occurred before his arrival in Baghdad, since after his death in ca. 867 CE al-Kindī's works and ideas had spread through his disciples to the regions of Khurāsān, which the young al-Fārābī presumably crossed on his way to the ʿAbbāsid capital.[52] The story of how al-Fārābī may first have assimilated and then gradually broken away from this Kindīan tradition is one of the concerns of the present study.

Yet with regard to al-Fārābī's 'standard' cosmology, i.e., the one expounded in the works whose authenticity is not debated, such as *Ārāʾ* and *Siyāsah*, and in spite of some basic structural resemblances, the two thinkers worked within quite different methodological perspectives. They also articulated drastically divergent cosmological doctrines on key points such as the creation of the world and the motion of the planets and orbs. Al-Kindī's worldview follows that of the Greek tradition in many respects, but it also contains distinctly Islamic characteristics, which are for the most part lacking in al-Fārābī. For instance, al-Kindī holds that the entire heaven obeys God's command, which it expresses in its regular, harmonious circular motion. Although it is intrinsically incorruptible, the heavens are not eternal and will pass away when God wills.[53] Hence, in addition to its subtle combination of Ptolemaic, Aristotelian, and Neoplatonic features, what distinguishes al-Kindī's cosmology is the omnipresence and omnipotence of God. God not only brings the universe into being, but He also inspires the heavenly motion, and He will eventually destroy His creation. What we witness, then, is a cosmology subordinated, so to speak, to a theology, in which God is presented as the only real and eternal being.

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are surprising. Recent publications building on the work of Maróth and Druart, notably by Vallat (2004 and "Al-Farabi's arguments for the Eternity of the World," forthcoming) and Janos (2010a), have shown convincingly that al-Fārābī knew about and drew heavily from the Arabic Neoplatonic texts and especially the *Proclus arabus*. The present study will largely confirm this hypothesis. Moreover, the research that has until now focused on the Baghdad School seems too limited to allow for a definitive conclusion on the place of the *Neoplatonica arabica* in this circle and their use of it. For instance, if the contention put forth by M. Rashed that *Jamʿ* was composed by one of the Ibn ʿAdī brothers is indeed true, then this author was definitely using the Arabic Plotinus and Proclus texts, as is substantiated by the many terminological and doctrinal parallels between these works.

[52] Adamson (2007a, 14).

[53] Adamson (2007a, 86-88).

This cosmological approach was no doubt shaped by al-Kindī's belief in the fundamental compatibility between Islam and philosophy. As will be shown later on, the cosmology al-Fārābī articulates in his late treatises is radically different from the model outlined above, primarily because it does not endow the Godhead with such an active role in the creation and governing of the heavens.

The question of why al-Fārābī generally ignores his predecessor al-Kindī and never explicitly mentions or cites his works requires an explanation, especially since al-Kindī had elaborated the most coherent cosmological model before al-Fārābī's time. One explanation has to do with the lack of availability or the limited diffusion of al-Kindī's writings in tenth-century Baghdad. For al-Kindī, whose career reached a peak under al-Maʾmūn and al-Muʿtaṣim, subsequently fell in disfavour under al-Mutawakkil, under whose rule many of his treatises were likely destroyed or dispersed as a result of the jealousy and scheming of courtiers. Al-Kindī's posthumous philosophical influence extended primarily to the north-eastern parts of the Islamic lands, to Transoxania and Khurāsān rather than Baghdad, areas whence his most distinguished disciples hailed.

Yet this interpretation is not entirely satisfactory, for al-Kindī's teachings were transmitted well into the tenth century and to thinkers who dwelled in Baghdad, as can be seen in the case of al-ʿĀmirī (d. 992 CE).[54] Moreover, the fact that the Kindīan tradition flourished especially in geographical areas that were comparatively close to al-Fārābī's homeland and which he at any rate would have had to cross on his way to Baghdad also argues against it. It is therefore more plausible that al-Fārābī's silence was deliberate and intended as a mark of disapproval concerning both the method and content of al-Kindī's philosophy. If the hypothesis defended later on in this book according to which al-Fārābī was first influenced by al-Kindī and subsequently departed from his fundamental views on cosmology and theology is correct, then it is understandable that al-Fārābī would later have ignored this thinker. Indeed, some of the Second Teacher's mature doctrines may be construed as implicit responses to the Kindīan tradition on specific issues such as the creation of the world and the cause of celestial motion.

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[54] For this thinker and the Kindīan tradition in general, see Rowson (1988 and 1990) and Adamson (2007a, 12–17 and 2007b).

Turning to Abū Bakr al-Rāzī, we are dealing in this case with a very different kind of cosmology, whose sources are somewhat obscure, although they evoke numerous features of Platonic philosophy. Unlike al-Kindī, al-Rāzī is not a creationist in the orthodox theological sense and upholds instead the existence of five eternal principles that are the cause of all the other beings: soul, matter, time, space, and God. Al-Rāzī thus asserted the eternity *and* uncausedness of various cosmic principles apart from the Godhead, a relatively rare position in Arabic intellectual history. The universe taken as a whole, however, is not eternal and undergoes periods of destruction and recreation out of a primeval state, due to the activity of the demiurge, who mixes soul and matter together to form the various beings. Moreover, although few writings by al-Rāzī have survived, it seems that he was not as interested as al-Kindī and al-Fārābī in the nature of the celestial bodies and in astronomy. A quick glance at al-Rāzī's cosmology shows that it differs substantially, both in its doctrines and sources, from al-Fārābī's cosmology and that it does not address the issues that were later to occupy the Second Teacher, such as celestial intellection and causality. It therefore could not have served as a model for it except in the negative sense that al-Fārābī may have consciously reacted to the main cosmological tenets formulated by al-Rāzī.[55]

Hence, in spite of the importance that al-Kindī, al-Rāzī, and al-Fārābī attribute to cosmology and the fact that each one of them elaborated a quite original cosmological model, their systems have little in common in their essentials, a fact which testifies to the vitality and diversity of cosmological speculation during the ninth and tenth centuries in Islam. Such are their differences that one may even speak here of three different cosmological paradigms, which rely on different sources and principles, and which experienced diverging fates in later Islamic thought. While al-Rāzī's intriguing Platonizing worldview virtually disappeared with its originator, al-Kindī's and especially al-Fārābī's cosmological models (including their views on creation) were destined to have a profound impact on later generations of thinkers.

It should be stressed that although al-Fārābī does not mention al-Kindī and al-Rāzī by name in his extant writings, it is likely that he knew their doctrines well. Not only did these thinkers evolve in the

[55] In this regard, Ibn al-Qifṭī (1903, 280) lists a *Kitāb al-radd ʿalā l-Rāzī* in his bibliography of al-Fārābī. This treatise is no longer extant, but it indicates that al-Fārābī may have attempted to refute some of the cosmological theories of al-Rāzī.

same cultural and geographical sphere, but many of al-Fārābī's theories may be seen as responses to specific ideas developed by these earlier thinkers. After all, al-Kindī and al-Rāzī were the authors of the main Arabic cosmological models al-Fārābī could have turned to in his youth. What this indicates is that al-Fārābī was able—partly due to the sources he consulted, and partly due to his own engagement with these scholars' legacy—to elaborate a new cosmological model that departed substantially from that of his illustrious predecessors. In turn, this suggests that al-Fārābī's cosmology was elaborated over a protracted period of time and through a process of assimilation, rejection, and transformation whose various facets need to be carefully reconstructed.

1.3.3. *The Growth of ʿilm al-hayʾah*

Finally, our picture of the early Islamic context in which al-Fārābī's cosmology took root should include some comments on Arabic astronomy during the eighth, ninth, and tenth centuries. Although there existed a traditional form of astronomical practice among the Arabs of the pre-Islamic era, mathematical astronomy in Islam developed directly out of the translation of Indian, Persian, and especially Greek scientific works.[56] Early Arabic astronomers regarded Ptolemy as the astronomical authority *par excellence*, and his main work, *Almagest*, defined the methodological horizon within which they operated. This, however, did not prevent them from modifying some features of the Ptolemaic legacy and from significantly expanding the corpus of observational data they inherited from antiquity. Indeed, Arabic astronomers placed a new emphasis on observation and systematically corrected the astronomical tables they inherited from India and Greece. Vast observational programs were patronized and implemented by some of the ʿAbbāsid caliphs, especially al-Maʾmūn, which resulted in the composition of new *zījes* or astronomical tables. In addition, reputed Arabic astronomers such as al-Farghānī (d. after 861 CE), Thābit ibn Qurra (d. 901 CE), and al-Battānī (d. 929 CE) were actively engaged both in spreading Ptolemy's theories through their various writings and in revising or perfecting some of the findings of previous scientists. Their manuals contributed to the dissemination of astronomical knowledge and of the geocentric model and its system of

[56] For pre-Islamic Arab astronomy and the *anwāʾ* tradition, see Varisco (1992 and 2000) and *EI*³.

nested orbs among educated laypersons and the social elites. It is of little surprise, then, that the contemporary philosophers and many theologians shared this common scientific worldview.

Furthermore, Arabic astronomers were aware of the need to improve Ptolemy's explanation of how the mathematical models posited by astronomy relate to the physical world. This led them to reflect on various aspects of the astronomical method and to theorize on the relation between astronomy and the other sciences, particularly natural philosophy. In most cases, their goal was to harmonize physics and astronomy and to develop geometric models of planetary motion that would fully correspond to physical reality. Although this trend developed to its full extent in the post-classical *hayʾah* literature and found an outstanding embodiment in the works of al-Ṭūsī, early Arabic astronomers significantly prepared the way for this advance.[57]

It is this latter aspect in the development of *ʿilm al-hayʾah* that is relevant to our analysis of al-Fārābī's cosmology, since this particular endeavour on the part of Arabic astronomers overlaps with the early history of *falsafah*. Indeed, both groups reflected on the relation and interactions between the various sciences and on the principles of the astronomical discipline in particular. Now, this is a question that also preoccupied the Second Teacher. Not only did he write works in which he discusses the classification, status, and method of the philosophical sciences (including astronomy)—as in *Iḥṣāʾ*, *Burhān*, and *Mūsīqā*—but al-Fārābī's own attempt at providing a cosmological synthesis betrays a similar concern for harmonizing the latest astronomical findings of the age with the main principles of Aristotelian physics. Thus, the Arabic astronomers and al-Fārābī were engaged in what was in many ways a similar project, an unsurprising fact given the general scientific priorities of the age and the frequent interplay between *ʿilm al-hayʾah* and *falsafah* throughout their history.[58] Like the Arabic astronomers, al-Fārābī regarded Ptolemy as the foremost authority in the field of astronomy, in the same manner that he held Aristotle as a paragon in the study of logic and philosophy. This means that al-Fārābī would have

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[57] For a survey of the sources of early Arabic astronomy and of the early practitioners of this science, see Nallino (1944, vol. 5), Pingree (1973), Morelon (1996a and 1996b), and Saliba (1994a and 2007).

[58] The history of the interactions between *ʿilm al-hayʾah* and *falsafah* remains to be studied, particularly in the eastern Islamic lands; for efforts in this direction, see Saliba (2004), Ragep and Ragep (2004), and Janos (2010b and 2011).

felt the need to reconcile these two authorities. But unlike the case of the astronomers, who limited their efforts to the field of astronomy, in the case of al-Fārābī and later Ibn Sīnā, this problem of reconciling Ptolemy and Aristotle had offshoots that extended to many other parts of their philosophy, as can be seen in their treatment of celestial motion, causation, and intellection.

The output of ninth- and tenth-century Arabic astronomers enables us to gauge the progress achieved in mathematical astronomy during the early Islamic period and indicates the extent to which Ptolemaic material had been assimilated and naturalized within Islamic culture, including *falsafah*. These astronomical works represent potentially important sources which the Second Teacher and other philosophers may have consulted. But precisely for this reason, and because of the high standard of this science during al-Fārābī's time, it is not always possible to gauge how much of this thinker's astronomical knowledge is derived directly from the Ptolemaic texts as opposed to through the intermediary of Arabic authors. This is the case, notably, of *Planetary Hypotheses*, Ptolemy's second most important astronomical treatise, which is not mentioned expressly by al-Fārābī in any of his writings, but which seems to underlie some of his cosmological theories, especially his theory of planetary motion (see ch. 4). Al-Fārābī could have read parts of it in the form of a short Arabic recension or alternatively the contents of this work could have reached him through the intermediary of contemporary Arabic astronomical texts. This being said, al-Fārābī does not mention any contemporary Arabic astronomer by name, and for this reason we may surmise that he had first hand access to the Arabic translations of Ptolemy, including at least parts of *Planetary Hypotheses*.[59]

This overview of the Greek and early Arabic textual and historical contexts places al-Fārābī squarely at the confluence of various scientific, philosophical, and theological traditions, all of which, it may be surmised, left an imprint on the Second Teacher's method and thought. In view of the foregoing, there can be little doubt that al-Fārābī's cosmological horizon extended beyond the legacy of Greek philosophy

[59] This may be true even though al-Fārābī does not cite this text. The same problem applies to Ibn Sīnā, who most likely read this Ptolemaic work, but does not mention it by name; see Janos (2011). The fate of *Planetary Hypotheses* in the early Arabic milieu is at any rate obscure and poorly understood by scholars, in spite of the seemingly wide impact of its theories on the works of many Arabic authors.

and was informed by a number of other intellectual factors stemming from his own cultural environment. Al-Fārābī's cosmology was shaped just as much by early Muslim and Christian theology and by the development of Arabic astronomy and philosophy as by the translations of the Greek philosophical and astronomical texts that he read. This diversity of stimuli and outlooks can help to explain al-Fārābī's intention to elaborate a new and state-of-the-art cosmological model, both with regard to its synthetic tendency and to the fact that it may often be seen as a reaction to other cosmological ideas endorsed by his predecessors or contemporaries—at any rate, this represents the working hypothesis of the present book.

1.4. *Cosmology in al-Fārābī's Philosophical Treatises and the Problem with Mahdi's Hypothesis*

Al- Fārābī also discussed cosmological questions in independent works in addition to his various commentaries on Aristotle and Ptolemy. However, only a fragment of this output is extant. With regard to the physical works, there are substantial citations from his treatise *On Changing Beings*, as well as the treatise *Against Philoponus*. While al-Fārābī's *Physics* commentary was probably written in the style of the late antique exegetical tradition and consisted of *lemmata* accompanied by his personal remarks, *On Changing Beings* was an independent treatise loosely based on *Physics* 8 that covered a wide diversity of physical topics, such as motion, time, and the nature of sublunary beings. Both the *Physics* commentary and *On Changing Beings* are frequently mentioned by later authors, such as Ibn Bājjah, Maimonides, and Ibn Rushd, which shows that al-Fārābī's views on natural philosophy were widely read by later Muslim and Jewish authors.[60] As for *Against Philoponus*, it is a polemical treatise on the subject of aether that was intended as a reply to the philosopher and theologian John Philoponus. It represents a valuable source for our purposes, in spite of the difficulty of its interpretation.[61]

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[60] See M. Rashed (2008) for an analysis of *On Changing Beings*. Lettinck (1994, 2) seems to imply that al-Fārābī's *Physics* commentary and *On Changing Beings* were one and the same work. But although the latter focuses on topics discussed in Book 8 of *Physics* especially, it is unclear whether it was originally part of al-Fārābī's commentary or composed as a separate treatise.

[61] See Mahdi (1972) for an Arabic edition of *Against Philoponus* and Mahdi (1967) for an analysis and English translation of the same work. This work will be analyzed in chapter 3.

It should be noted that in addition to these works, al-Fārābī composed several other, albeit no longer extant, treatises which addressed specific cosmological issues. This was the case of *Kitāb fī anna ḥarakat al-falak sarmadiyyah*, *Kitāb al-nujūm*, and of *Kitāb al-taʾthīrāt al-ʿulwiyyah*, three works mentioned by Ibn al-Qifṭī and which dealt with specific cosmological issues.[62] Finally, one should mention the intriguing reference to a *Risālah fī ḥudūth al-ʿālam* given by Brockelmann in *GAL*.[63] Since al-Fārābī is laconic on various key issues of his cosmology, such as his theory of celestial motion and the issue of the eternity of the world, the loss of these works is regrettable.

Fortunately, however, al-Fārābī provides lengthy cosmological descriptions in other works that have survived, especially in his emanationist treatises, *Ārāʾ* and *Siyāsah*. Thanks largely to these two works, it is possible, on the basis of the information they contain, to reconstruct his cosmology with a satisfactory degree of precision. The emanationist treatises, by far our most important sources for al-Fārābī's cosmology, contain two main sections: the first one, broadly speaking, deals with metaphysical and cosmological issues; the second one focuses on human psychology, prophetology, and virtuous and corrupt political entities. This structure is not fortuitous: the microcosm of the individual human being and of human societies should ideally reflect the order and harmony of the universe, a sequence which shows the impact of cosmology on al-Fārābī's political theories. In the first part of these treatises, al-Fārābī provides a detailed description of the heavens and of the principles governing them, intertwining physical, metaphysical, and astronomical ideas. He devotes many pages to the substance of the celestial bodies and their hierarchical order, as well as to the nature and activity of the celestial souls and separate intellects. These entities, which lie beyond the orb of the moon, are in a sense the counterpart of the beings in the sublunary realm, and their perfect harmony and order stand as a model for the ideal human life. This explains the close symmetry al-Fārābī establishes between cosmology, human psychology, and the ideal political organization. These works testify not only that Ptolemy's influence on al-Fārābī extended beyond the latter's commentary on *Almagest*, but also that it was integrated in a larger cosmological framework drawing on a variety of other intellectual trends.

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[62] Ibn al-Qifṭī (1903, 279–280).
[63] Brockelmann (1996, vol. 1, 235).

At this point it is necessary to address an objection formulated by M. Mahdi regarding al-Fārābī's cosmology and the contents of *Ārāʾ* and *Siyāsah*, which, if true, would deprive these treatises of much of their philosophical value. Mahdi contends that *Ārāʾ* and *Siyāsah* do not express al-Fārābī's true cosmological doctrines and should be interpreted instead as political metaphors or pseudo-scientific accounts addressed to the inhabitants of the virtuous city. As Mahdi writes, these treatises do not "embody either Alfarabi's theoretical philosophy or his practical philosophy, but are only examples of the kind of regimes that can be constructed by political philosophy."[64] In other words, the cosmology described by al-Fārābī fulfills a purely rhetorical function and is devoid of a scientific foundation. It may best be called, as Mahdi suggests, a "political cosmology."[65] Central to Mahdi's argument is the claim that *Ārāʾ* and *Siyāsah* are the only works that draw on Neoplatonic doctrine and that develop an emanationist system, while al-Fārābī's "scientific or philosophic works proper" are free of any such elements.[66]

Mahdi is undoubtedly right in pointing to the political relevance of al-Fārābī's cosmological theories. Indeed, they form the backdrop against which his prophetology and political system unfold and bear an intricate link with other aspects of his thought. But it is important to stress that it is al-Fārābī's cosmology and metaphysics that are the foundation on which politics can be developed, and not vice versa, as Mahdi would have it. This point has been aptly shown by P. Vallat in his recent monograph, which redefines al-Fārābī's political ideas in light of the late antique, especially Neoplatonic, metaphysical tradition.[67] It is also borne out by textual evidence. Al-Fārābī repeatedly stresses in his works the primacy of the theoretical sciences and their demonstrative method, the certain knowledge they produce, and the fact that the practical disciplines and politics are to be modeled on them.[68] On the other hand, al-Fārābī nowhere states that his cosmology should be construed as a political metaphor, nor is there any textual evidence in his works to support this view.

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[64] Mahdi (2001, 7).
[65] Mahdi (2001, 82, 121–122, 124).
[66] Mahdi (in al-Fārābī 2001c, the "Introduction" to the 1962 edition).
[67] Vallat (2004).
[68] See for example *Taḥṣīl* (al-Fārābī 2001c, 39–42).

As will be argued in various sections of this book, al-Fārābī addresses the same issues and articulates identical cosmological theories—including what Mahdi calls emanation—in some of his other treatises, such as *Mūsīqā*, *Falsafat Arisṭūṭālīs*, and *Risālah fī l-ʿaql*, which bear no concrete link to politics. This shows that the emanationist treatises do not differ radically from the rest of al-Fārābī's output and that Mahdi's division between "popular" and "philosophical" works, or between "Neoplatonic" and "Aristotelian" works, is unfounded. Far from being a mere by-product of al-Fārābī's political reflection, the cosmological ideas presented in *Ārāʾ* and *Siyāsah* are in fact a direct continuity of the Greek philosophical (especially commentatorial) tradition of late antiquity, and they may be seen as original re-elaborations of old philosophical issues and problems. A study of some of the key cosmological concepts that al-Fārābī discusses shows that he engaged critically with the Greco-Arabic sources and that he elaborated his theories through a process of criticism and assimilation, the product of which appears in these texts.

Furthermore, the fact that these treatises incorporate much of the astronomical knowledge available during al-Fārābī's time (ch. 2, 1.1. and 1.2.) indicates that he made conscious efforts to root his cosmology in a valid scientific approach. Like Aristotle and Ibn Sīnā, al-Fārābī was aware that a successful cosmological model could only be devised if one paid close attention to astronomical findings and to how these relate to physical and metaphysical theories. The very fact that later Arabic thinkers, such as Ibn Sīnā and al-Kirmānī, considered al-Fārābī's cosmology a serious and viable philosophical model and adopted some of its main features indicates clearly that these thinkers did not interpret it merely as a political metaphor, but rather as a coherent system grounded in scientific theory. This was also the opinion of al-Ghazālī, who deemed it necessary to compose an entire book, *Tahāfut al-falāsifah*, to refute the cosmological model of these philosophers.

Finally, a word must be said about the structure and title of these works. In this regard, Mahdi's decision to call the emanationist treatises "political" is reductionist, as they are divided into two main sections, only the latter of which deals properly speaking (and only partly) with politics. As for the first section, it discusses the various physical and metaphysical principles that constitute and govern the universe, thereby stressing the primacy of metaphysics and cosmology over politics both in the order of existence and in the order of philosophical instruction. In this respect, and as U. Rudolph stressed, the title of these works has

been too often distorted. With respect to *Ārāʾ*, for instance, the theories discussed are primarily not (political) "views" or "opinions" (*ārāʾ*), but rather philosophical "principles" (*mabādiʾ*), which only subsequently can be expressed in terms of opinions (*ārāʾ*) in a political context; hence, the full title of the treatise: *Mabādiʾ ārāʾ ahl al-madīnah al-fāḍilah*.[69] And in the case of *Siyāsah*, its alternative title *Mabādiʾ l-mawjūdāt* seems more appropriate, since in this case as well the work begins by enumerating the various ontological principles that underlie the universe. It is only subsequently that al-Fārābī explains how these may serve as axioms for the views and imitative practices performed in human societies. For all of the reasons discussed above, Mahdi's interpretation of al-Fārābī's cosmology seems unjustifiably reductionist.[70]

Apart from the emanationist treatises, other works by the Second Teacher also shed valuable light on various aspects of his cosmology, both in terms of method and content, especially *Fī l-ʿaql*, *Mūsīqā*, *Fuṣūl*, *Taḥṣīl*, and *Iḥṣāʾ*. These works were not written with the express purpose of discussing cosmological issues, but they contain much, albeit scattered, material that should be assembled and carefully examined. Also noteworthy are two treatises on astrology, which will be analyzed in detail in a later section, as well as some of al-Fārābī's logical works, such as *K. al-qiyās*, *ʿIbārah*, and *Burhān*, which provide insight into his method and key scientific concepts that appear in his cosmological discussions, such as experience and induction.

In addition to this group of authentic texts, there is a cluster of works whose authorship is unclear or has recently been challenged by scholars. It consists chiefly of *Jamʿ*, *Jawābāt*, *Ithbāt*, *Taʿlīqāt*, *ʿUyūn*, and *Daʿāwā*, all of which will figure prominently in the forthcoming analysis. Indeed, the motivation for studying these works is twofold. First, some of them, such as *Jamʿ*, play a potentially crucial role in the

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[69] Rudolph (2008). I decided to refer to this treatise simply as *Ārāʾ* rather than by its full title for the sake of stylistic simplicity and to demarcate it clearly from *Siyāsah*, also known as *Mabādiʾ l-mawjūdāt*.

[70] In fact, Mahdi himself at one point admits "that it is perhaps not quite fair to speak of 'political cosmology' or 'myth,' that is, of a cosmos or a human body presented with no attention to the scientific accounts of the cosmos or of the human body. For it is precisely the *relationship* between science and the city that is at issue. … Differently stated, the integrity of scientific knowledge should be maintained even when it is used to help form the opinions of the citizens" (2001, 11). From Mahdi's own admission, then, there is no reason not to take the cosmology developed in these works as a serious and genuine attempt on the part of al-Fārābī to provide a valid "scientific" worldview.

modern understanding of al-Fārābī's philosophy, and they have in this respect been the object of considerable scholarly attention in recent years, which must be taken into account. Yet in my view, some key aspects of their cosmological doctrine have been misconstrued, which calls for a continuation of the ongoing dialogue on their nature and authenticity. Second, these works discuss important and sometimes strikingly original cosmological doctrines that are well worth analyzing for their own sake, and which are of interest not only with regard to al-Fārābī's cosmology, but with regard to early Arabic cosmology in general.

All in all, then, al-Fārābī discusses cosmological topics in various types of works and in different kinds of philosophical contexts. In spite of the fragmentary state of the Fārābian corpus, especially with regard to its commentaries, the evidence contained in these works, when added to the reports of later medieval authors, enable one to reconstruct a relatively satisfactory picture of his cosmology, in spite of the fact that some links are inevitably missing. The literary diversity of al-Fārābī's output can be explained by the fact that he was the recipient of a complex and multifaceted cosmological tradition, which was encapsulated in various kinds of philosophical and astronomical works. This diversity of textual genres is mirrored by the diversity of the disciplines that participate in the cosmological inquiry and by the complexity of al-Fārābī's philosophical method. It is to these issues that I now wish to turn.

2. *Astronomy and its Place in the Philosophical Curriculum*

The previous paragraphs helped to delineate some of the main trends prevalent in the intellectual milieu frequented by al-Fārābī, as well as the nature of his output. One important aspect of the heritage underlined above is the corpus of Greek astronomical texts translated into Arabic during the ninth and tenth centuries, which played an important role in shaping the *falāsifah*'s cosmology. Like many Greek philosophers before him, al-Fārābī believes that it is necessary to take into account the findings accumulated by the astronomers in order to elaborate a valid cosmological and metaphysical system. How did he perceive the place of astronomy in philosophy and how did he understand the method of this science? My aim in the following paragraphs is to shed light on al-Fārābī's conception of the method and epistemic

foundations of astronomy, on how it may benefit the philosophical enterprise, and on how it relates to the other philosophical sciences, particularly physics and metaphysics. Medieval thinkers in general relied on all or a combination of these disciplines to elaborate their cosmology, but they were often in disagreement as to their respective scope and method. Following these various lines of inquiry will enable us to situate al-Fārābī within the history of Greek and Arabic astronomy and provide a case study of an early Muslim philosopher's knowledge of this science. Before doing so, however, it is necessary to address the important question of how al-Fārābī perceived the relation between astronomy and astrology.

2.1. *Astronomy and Astrology and their Subject Matter*

The conception of how astronomy relates to astrology has varied considerably from culture to culture over the centuries. In the case of early and classical Islam, these two disciplines were not always clearly distinguished, but many thinkers were aware of a fundamental epistemological gap between the mathematics-based method of astronomy and the more speculative approach of astrology. While some Muslim authors practiced these two disciplines conjointly during their lifetime without worrying unduly about their relation, others vehemently advocated a demarcation between astronomy and astrology on the basis either of their incompatible method or of their different rapport to religious orthodoxy.

One of the turning points in the history of astronomy's emancipation from astrology in Islam is usually situated in the eleventh century and explained in terms of the advances made in mathematical astronomy and the appearance of more elaborate classifications of the sciences. Ibn Sīnā is often hailed as a key figure in this transition. He was one of the first thinkers to distinguish the two disciplines conceptually and terminologically, and the systematic criticism of astrology he articulated contributed to shaping future perceptions on the topic.[71] Ibn Sīnā regarded astronomy as an independent and

[71] Mehren (1885). More recently, Y. Michot (2006) devoted an entire study to this treatise, which also contains a wealth of information on the medieval Muslim perception of astrology in general. Al-Bīrūnī is another important figure in this respect, but his relation to astrology is more ambiguous, since he himself composed treatises on this art; see Pines (1964).

well-delineated science possessing its own subject matter and method primarily defined by its use of mathematical proof. In his *Risālah fī aqsām al-ʿulūm al-ʿaqliyyah*, for instance, he describes astronomy (*ʿilm al-hayʾah*) as a mathematical science (*ʿilm riyāḍī*) that is exclusively concerned with the external aspects of superlunary phenomena, while astrology (*aḥkām al-nujūm*) is classified as a sub-branch of the physical science (*al-ṭabīʿiyyah*).[72] In proposing such a scheme, the *shaykh al-raʾīs* departed from the earlier classifications of the sciences devised by al-Khwārizmī, al-Fārābī, and others, which had subsumed astrology and astronomy under a single, overarching science known as *ʿilm al-nujūm*.[73] From Ibn Sīnā onward, *ʿilm al-hayʾah* gradually replaced *ʿilm al-nujūm* in the mainstream philosophical and theological traditions and came to refer exclusively to mathematical astronomy.[74]

It has not been sufficiently emphasized, however, that many features of Ibn Sīnā's anti-astrology position were anticipated nearly a century earlier by al-Fārābī, who in several of his works had attempted to separate astronomy from astrology as well as to distinguish between the valid and invalid parts of astrology itself. Starting with *Iḥṣāʾ*, which contains al-Fārābī's most systematic description and classification of the various philosophical disciplines, one reads that the "science of the stars" (*ʿilm al-nujūm*) is one of the mathematical sciences and comprises two parts: astrology or rather, judicial astrology (*ʿilm aḥkām al-nujūm*), and mathematical astronomy (*ʿilm al-nujūm al-taʿlīmī*).[75] The second part, astronomy proper, investigates the exterior aspects of the heavenly bodies, those that pertain to numbers and measurements, such as the sizes, distances, and motions of the planets. As for the first part, astrology, it focuses on the heavenly indications and signs that enable humans to predict future events and to know past and present events. Al-Fārābī therefore draws a distinction between astronomy and

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[72] Ibn Sīnā (1999, 120–121). It is interesting to note that many Latin thinkers also classified astrology as a physical science, as is shown by Lindberg (2007, 270–277).

[73] Ragep (1993, vol. 1, 34–35); Bosworth (1963, especially 101 and 110) briefly compares al-Fārābī's *Iḥṣāʾ* to al-Khwārizmī's *Mafātīḥ al-ʿulūm*.

[74] For instance, ʿAbd al-Laṭīf al-Baghdādī inserted a section on astronomy in his commentary on Book Lambda, which he entitled *Mukhtaṣar mā tabayyana min al-ḥarakāt fī [ʿilm] al-hayʾah* (Neuwirth 1976, 67). Fakhr al-Dīn al-Rāzī in his various works, including his *tafsīr*, refers to the astronomers exclusively as *aṣḥāb ʿilm al-hayʾah* and to the discipline itself as *ʿilm al-hayʾah*; see for instance al-Rāzī (2002, 94 ff.).

[75] Al-Fārābī (1949, 84). The expression *ʿilm al-nujūm* also appears in one of al-Fārābī's introductory works on logic, *Naṣṣ al-tawṭiʾah* (al-Fārābī 1985c, vol. 1, 59,1), where it is classified as a sub-section of the mathematical part of philosophy.

astrology in *Iḫṣāʾ* that is based on both terminology and subject matter, but he does not take the extra step to separate the two disciplines. Rather, his classification of the sciences presents them as two branches of a single, integrated discipline called *ʿilm al-nujūm*, and in that sense it differs significantly from Ibn Sīnā's account. At any rate, this classification and the use of the generic expression *ʿilm al-nujūm* seem to have been widespread during this period, and they can also be found in the works of other authors such as al-Khwārizmī and the Ikhwān al-Ṣafāʾ.[76]

Al-Fārābī elaborates on the various sub-branches of astrology in two treatises that he wrote to this effect: *Risālah fī faḍīlat al-ʿulūm wa-l-ṣināʿāt*, also known as *Maqālah fīmā yaṣiḥḥu wa-lā yaṣiḥḥu min aḥkām al-nujūm*, and *Maqālah fī l-jihah allatī yaṣiḥḥu ʿalayhā l-qawl fī aḥkām al-nujūm*.[77] Before I examine these treatises, it would be helpful to contextualize them within the ʿAbbasid society of the ninth and tenth centuries and thus to illuminate the circumstances in which these works originated. The early ʿAbbāsid caliphs, such as al-Manṣūr, al-Mahdī, Hārūn al-Rashīd, and al-Maʾmūn, were staunch supporters of astrology and hosted numerous astrologers at their court in Baghdad.[78] These astrologers fulfilled the purpose of advising the caliphs and their entourage of auspicious dates for the realization of important undertakings, such as military battles, the signing of treaties, the foundation of cities, etc. At a more intimate level, they also provided genethlialogical information about high-ranked individuals and insight into their future

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[76] Al-Khwārizmī (1968, 210–232); Ikhwān al-Ṣafāʾ (1957, vol. 1, 22, 114–115).

[77] Al-Fārābī (1976 and 1987). Some features of these works have already been discussed by Druart (1978 and 1979), Michot (2006, 55–60), and Saliba (1991, 68–69). The history of the edition of these two treatises is somewhat confusing, due to the various titles under which they were published. The first treatise was initially published by Dieterici (1890, 104–114) under the title *Nukat fīmā yaṣiḥḥu wa-lā yaṣiḥḥu min aḥkām al-nujūm*, and it was soon followed by a German translation (Dieterici 1892, 170–186). An anonymous edition entitled *Risālah fī faḍīlat al-ʿulūm wa-l-ṣināʿāt* was then published in Hayderabad on two occasions (1921 and 1948). Finally, the treatise was edited and published a third time by Jaʿfar Āl Yāsīn (al-Fārābī 1992, 281–301) under the title *Maqālat Abī Naṣr al-Fārābī fī mā yaṣiḥḥu wa-mā lā yaṣiḥḥu min aḥkām al-nujūm*. This astrological work is not by al-Fārābī's hand. Its contents are related by Abū Isḥāq Ibrāhīm ibn ʿAbd Allāh al-Baghdādī, who claims to have asked the Second Teacher to help him distinguish the true from the false in the realm of astrological study. As for the second treatise, which is much shorter and also seems to have been transmitted to us indirectly—the text starts with the statement *qāla Abū Naṣr*—it has to my knowledge been edited only once by M. Mahdi (1976, 69–74); cf. the French translation by Druart (1979, 47–51).

[78] Pingree (1990) and Gutas (1998, 45–53, 77–78, 108–110).

accomplishments. Apart from the court astrologers themselves, some of the prominent figures of ʿAbbāsid intellectual life, such as the Muʿtazilī theologian al-Naẓẓām (d. ca. 845 CE) and the philosopher al-Kindī, fully embraced astrological pursuits and even wrote treatises on the topic. Together with the foremost practitioners of this science, such as Abū Maʿshar al-Balkhī (d. 886 CE) (also a student of al-Kindī), they defended the legitimacy and methodological soundness of astrology, while at the same time aiming to establish it on a more secure Aristotelian theoretical foundation.[79]

Yet not everyone in ʿAbbāsid society recognized the soundness of astrology and the trustworthiness of the court astrologers: this was the case of the legal scholar al-Shāfiʿī (d. 820 CE) and the theologians Abū l-Hudhayl (d. ca. 840 CE) and al-Ashʿarī (d. 935 CE). A debate on the status of astrology involving the Muʿtazilī Abū l-Hudhayl allegedly took place at the court of the Caliph al-Maʾmūn, during which Abū l-Hudhayl criticized the astrologers' claim to know future events.[80] Regardless of whether this debate actually took place, it illustrates a certain tension in the Muslim perception of astrology during this period.

It is this tense and contradictory situation with respect to the status of astrology that al-Fārābī would have found upon his arrival in Baghdad and, later on, at the courts of Sayf al-Dawlah in Damascus and Aleppo. In fact, we know that al-Qabīṣī (d. 967 CE), one of the great astrologers of the classical period of Islam, dedicated an astrological treatise to Sayf al-Dawlah himself, thus indicating the latter's patronage of this art.[81] This state of affairs may have motivated al-Fārābī to articulate his own views on the subject and to clarify both the method of astrology and the place it should occupy in the philosophical curriculum. In this regard, we know that at least one of his treatises on the subject (discussed below) was written at the express request of a scholar in need of help to distinguish the valid and invalid aspects of the astrological discipline.

Returning to the two astrological treatises mentioned above, they articulate several important points that should be discussed in detail. One notices from the outset that al-Fārābī uses the terms *aḥkām al-nujūm* to refer to astrology both in the title and body of these two

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[79] Pingree (1990), Burnett (2002), and Adamson (2002b).
[80] Sayılı (1981, 32–33) and Adamson (2002b, 262).
[81] Pingree (1990, 299). See the recent study and translation of al-Qabīṣī's *Introduction to Astrology* by Burnett et al. (2004).

works, and thus that their terminology overlaps with that of *Iḥṣāʾ*. This is significant insofar as it shows that the Second Teacher used this formula consistently and that he differentiated astrology from astronomy, which he called in contrast either *ʿilm al-nujūm al-taʿlīmī* (as in *Iḥṣāʾ* and *Burhān*) or *ʿilm al-hayʾah* (in a minor treatise).[82] In terms of their contents, the main thrust of the argument put forth in these two works is that only some aspects of astrology are sound and permissible from a philosophical point of view, namely, those that study the physical influence of the heavenly bodies on sublunary beings. The main example given by al-Fārābī is the effect that the heavens have on growth and corruption. As he explains, the celestial bodies cause heat (*sukhūnah* or *ḥarārah*) to develop in the sublunary world as a result of the light they emit.[83] In this case, the scientist can rely on observations (*arṣād*) and experience (*tajribah*) to study these effects, two concepts which, as will be shown shortly, also play an important role in the astronomical method.[84] This sub-branch of astrology would nowadays correspond to a combination of biology and climatology, and in view of this it is easier to understand retrospectively why Ibn Sīnā transferred astrology to the field of natural philosophy.[85] Al-Fārābī is furthermore willing to accept

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[82] In the short treatise *Qawl al-Fārābī fī l-tanāsub wa-l-taʾlīf*; see al-Fārābī (1987, vol. 1, 504–506, 505). To my knowledge, this expression appears only once in al-Fārābī's corpus, but it is for all purposes synonymous to *ʿilm al-nujūm al-taʿlīmī*. Consequently, Druart's statement (1979, 47; cf. id. 1978, 43) that "l'arabe classique n'use pas de termes différents pour parler de l'astronomie, de la climatologie et de l'astrologie," while true in some cases, is nonetheless misleading. In the Arabic astronomical tradition, the terms *ʿilm al-hayʾah*, as used by such thinkers as Ibn Sīnā, al-Ṭūsī, and many later astronomers, refer exclusively to mathematical astronomy and exclude astrological pursuits, such as the prognostication of future events. Indeed, most *hayʾah* authors were careful to distinguish between astronomy and astrology at the terminological level, a distinction which furthermore entailed conceptual and methodological differences. Even the case of al-Fārābī does not vindicate Druart's statement. True, the expression *ʿilm al-nujūm* used in *Iḥṣāʾ* is ambiguous, since, as al-Fārābī himself explains, it includes and may refer to both astrology and astronomy. But as we have seen, al-Fārābī also possesses a more specific terminology, namely, *ʿilm al-nujūm al-taʿlīmī* and *ʿilm al-hayʾah*, two expressions that refer exclusively to mathematical astronomy and distinguish it from astrology, called *aḥkām al-nujūm*. As a corollary, Steinschneider's and Druart's decisions to translate the terms *aḥkām al-nujūm* that appear in the titles of al-Fārābī's two astrological treatises as "astronomy" are misleading, since these treatises discuss astrological themes, which bear no relation to mathematical astronomy. In fact, for al-Fārābī and most early Arabic thinkers, *aḥkām al-nujūm* refers exclusively to astrology; see Nallino (1944, vol. 5, 1 ff.), and Adamson (2007a, 192), who translates *aḥkām al-nujūm* as "astrology" in al-Kindī's works.

[83] Al-Fārābī (1976, 69 and 1992, 291–292). This feature of al-Fārābī's cosmology will be further addressed in chapter 2.

[84] Al-Fārābī (1976, 70–71, 73 and 1992, 286) and Druart (1979).

[85] Ibn Sīnā (1999, 120–121).

the theory that the celestial bodies have an impact on the humors composing the human body, and in that sense that they may influence people's behaviour to a certain extent.[86]

According to al-Fārābī, these sublunary events or occurrences (*umūr*) have causes (*ʿilal* or *asbāb*—both terms are used here), namely, the stars and planets, which means that they can be grasped by the intellect through experience. What makes this possible is the fact that these events happen "for the most part" (*ʿalā l-akthar*). They do not happen necessarily or always, due to the fact that there are various obstacles that can impede the actualization of the celestial influences, whether natural, such as cold air rising from the earth, or volitional, such as human decisions. In contrast to these events that happen for the most part and can be grasped through experience, there are accidental events (*umūr ittifāqiyyah*), which seldom occur and which do not possess well established causes. In this case, experience can be of no help.[87] All the astrological predictions concerning human actions fall in this category, which explains why al-Fārābī holds that they cannot be known with any certainty. For these accidental events, which happen neither necessarily nor for the most part, humans can only speculate as to their causes and establish fanciful correspondences. It is this practice which al-Fārābī holds responsible for the bad reputation associated with astrology.

It is on this distinction between what can be known through experience and what escapes human reason that al-Fārābī grounds his main refutation of the astrological discipline. These aspects of astrology that focus on accidental events are considered invalid, because they rest on an inadequate empirical foundation and make use of flawed analogical reasoning. For example, al-Fārābī ridicules the claim that an eclipse or the vision of something red in the heavens is supposed to announce the death of a king or an important dignitary.[88] According to him, this method establishes a fallacious correspondence between the heavenly sign and a sublunary event that is not grounded in a valid scientific approach. The very fact that the same conjunction of events (i.e., the eclipse or the color red and the death) cannot be seen to reoccur regularly through experience is enough to testify that the conclusion drawn by the astrologers is unfounded. Hence, because such purely

[86] Al-Fārābī (1976, 74).
[87] Al-Fārābī (1976, 72 and 1992, 286–290).
[88] Al-Fārābī (1992, sec. 23–24, 296–297).

hypothetical predictions cannot be vindicated by experience, al-Fārābī categorically rejects the idea that astrology can lead to the knowledge of future events and that it represents a valid form of divination.[89]

Consequently, one realizes that the crux of al-Fārābī's criticism of astrology does not focus on the rejection of celestial causation on the sublunary world—a phenomenon which can be attested through observation, and a proposition which in any case al-Fārābī endorsed from his reading of Aristotle's physical treatises—but rather on the denial that: a) physical properties such as coldness and heat can be ascribed to the planets and stars themselves; b) that the planets and stars are signs or symbols warning humanity of impending events that will necessarily occur; and c) that all celestial effects always and necessarily occur, a view which does not take into account the various obstacles—both physical and volitional—that impede their realization. As a corollary, al-Fārābī believes that human will escapes the determinism of the stars, rendering the astrological project ultimately vain.[90]

For all of these reasons, it is not surprising that al-Fārābī excludes these kinds of astrological pursuits from the realm of certain philosophical knowledge. The invalid part of astrology should be avoided altogether, as it does not belong to true scientific practice. Given the absence of a clear precedent in the early Arabic philosophical tradition, the insight al-Fārābī provides into the various methodological aspects of astrology and the fact that he anticipated several key features of Ibn Sīnā's attitude are remarkable. This is all the more striking when one realizes that al-Kindī and his circle had endorsed astrology and counted at least one famous astrologer (Abū Maʿshar) in their midst.[91] And while al-Fārābī's attitude toward astrology may have had several

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[89] In a sense, then, it appears that al-Fārābī is arguing for a distinction between what one might call 'natural' or 'physical' astrology on the one hand and 'judicial' astrology on the other.

[90] For the conclusion that human free will escapes the determinism of the stars, see al-Fārābī (1976, 74). But some Arabic astrologers managed to reconcile astral determinism with human free will; for a discussion of this issue in the circle of al-Kindī and Abū Maʿshar, see Adamson (2002b, 260 ff.). It should also be noted that many Latin thinkers made a similar distinction between a valid and an invalid branch of astrology and also discussed its impact on the issue of free will; see Lindberg (2007, 270–277).

[91] Walzer (1957, 227), Wiesner (1993, 11, 32, especially 107 ff.), and Adamson (2007a, 7, 13–14, 191 ff.). Al-Kindī's various treatises on astrology are listed by Ibn al-Nadīm (1970, vol. 2, 621–622). Some titles, such as *Indications of the Two Maleficent Planets in the Sign of Cancer* and *Obtaining Indications about Happenings from Eclipses*, indicate clearly that al-Kindī was much less critical than al-Fārābī when dealing with astrology and fully embraced this discipline.

parallels in some of the contemporary theological circles, no extant *kalām* work of this period contains an investigation of the defects of astrology that can be compared to al-Fārābī's treatises.[92] In light of these remarks, Nallino's assertion that al-Fārābī's refutation of astrology is "childish" and inefficient cannot be accepted.[93]

It is interesting that al-Fārābī's treatment of astrology in these treatises informed the cosmological discussion in his other philosophical works. Indeed, the condemned aspects of astrological practice find no place in *Ārāʾ* and *Siyāsah*. On the other hand, al-Fārābī does discuss in these same works the physical influence that the planets have on generation and corruption through their heat and light, and, like al-Kindī, he made the planets efficient causes for the generation and corruption of sublunary beings.[94] Al-Fārābī therefore included some physical observations that overlap with the licit part of astrology.

In contrast to the ambiguity surrounding the classificatory status—if not the subject matter—of astrology, al-Fārābī clearly perceives astronomy as a mathematical science together with arithmetic, geometry, music, optics, statics, and mechanics.[95] This means on the one hand that mathematical astronomy does not deal with the celestial bodies as physical causes, as does physics or the physical part of astrology. On the other hand, it implies that the method of astronomy is based on mathematics and is therefore able to yield certain proofs that do not depend on irregular phenomena. But before discussing the method of

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[92] In spite of the apparent agreement of al-Fārābī and some of the contemporary theologians on the general invalidity of astrological predictions, further research is necessary to clarify the relation between their views. It should not be assumed, for instance, that they accepted al-Fārābī's endorsement of the physical aspects of astrology, i.e., of those aspects dealing with the influence of the planets on generation and corruption, especially given the frequent criticism of a secondary level of causality between God and the physical world in *kalām* (for an extensive analysis of this question in al-Ghazālī and in later *kalām* and *falsafah*, see Griffel 2009).

[93] Nallino (1944, 25).

[94] For example, al-Fārābī (1985a, 135 ff. and 1985b, 76 ff.). One question that emerges from the foregoing is whether the valid aspects of astrology—i.e., those dealing primarily with the study of how the heat and light emanating from the celestial bodies influence the generation and corruption of sublunary bodies—can truly be said to differ from physics, and especially those aspects of physics discussed in Aristotle's *On Generation and Corruption* and *Meteorology*. In other words, according to al-Fārābī, is not valid astrology, once purified of its undesirable elements, merely reducible to a part of physics, in which case its classification as part of the mathematical science of *ʿilm al-nujūm* would be inadequate and even confusing?

[95] Al-Fārābī (1949, 43); see also his *Introductory Risālah on Logic* (al-Fārābī 1957, 232).

astronomy in detail—the task of the next section—we must look into what al-Fārābī says concerning its subject matter. In *Iḥṣāʾ*, the subject matter of astronomy (*ʿilm al-nujūm al-taʿlīmī*) is divided into three parts. The first one deals with the exterior aspects of the heavenly bodies, such as their shapes, positions, sizes, and distances. It also includes an examination of the earth and asserts its stationary position in the world. The second part deals with all aspects of celestial motion, both the general motion shared by all the celestial orbs and the particular motions of the planets. The third part focuses on the earth and related geographical, climatological, and demographical questions. Due to its importance, I provide a new translation of the relevant passage of *Iḥṣāʾ*:

> Mathematical astronomy [*ʿilm al-nujūm al-taʿlīmī*] examines three aspects of the celestial bodies and the earth:
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> First, [it examines] their shapes, the positions of some of them vis-à-vis others, and their order in the world, as well as the sizes of their bodies, the relations that exist between them, and the measures of the distances between them. [It also shows] that the earth as a whole does not move from its place or in its place.
>
> Second, [it examines] how many motions the celestial bodies have and the fact that all of their motions are circular. [It studies] those [motions] that are common to the planets and other non-planetary bodies, and those [motions] common to all the planets as well as those that are specific to each. [It also examines] the number of each kind of these motions, the directions toward which they move, and from which direction each one of these motions originates. It also makes known the means to establish the place of each star one by one in the parts of the zodiac at each moment and with the totality of its kinds of movements.
>
> It investigates also into everything that is concomitant with the celestial bodies and each one of their motions in the zodiac and what pertains to the relation between them due to their conjunction, separation, and the diversity of their places vis-à-vis one another.
>
> In brief, [it examines] everything that pertains to their motions insofar as it does not relate to the earth, like the eclipse of the sun.[96] [And it investigates] everything that occurs to them on account of the place of the earth among them in the world, as in the case of the eclipse of the moon. [It looks into] the number of these attributes, in what state and at what time and how often they appear, like the rising and setting [of the sun] and other such things.

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[96] This sentence was translated incorrectly in one of my previous articles (Janos 2010b, 244). Al-Fārābī's point is that astronomy examines both phenomena that do not involve the earth and others that do: the eclipse of the sun is an example of the former, the eclipse of the moon an example of the latter.

> Third, it studies the inhabited and uninhabited regions of the earth. It establishes how many parts are inhabited and how many are its major regions which are the climes, and it classifies the places that happen to be inhabited at a particular time, as well as the place of each inhabited region and its organization in the world. Moreover, it studies what necessarily affects each one of the climes and inhabited zones, due to the common revolution of the world in the universe [*dawrat al-ʿālam al-mushtarakah li-l-kull*], which is the cycle of day and night, on account of the position of the earth: like the rising and setting of the sun, the length of days and nights, and other similar things. All of this is comprised by this science.[97]

Al-Fārābī's general exposition of the subject matter of astronomy is significant insofar as it anticipates the later descriptions found in the Arabic astronomical tradition or *ʿilm al-hayʾah*. The scheme outlined above reflects what was later known in *hayʾah* works as a distinction between *hayʾat al-arḍ* and *hayʾat al-samāʾ*, the former belonging to the third part of the *Iḥṣāʾ* account, the latter to the first and second parts.[98] The inclusion in the subject matter of astronomy of what today belongs to the disciplines of geography and climatology is one of the marking features of this classification. But I am mostly interested here in the first two parts of al-Fārābī's description, which focus on the superlunary world. Al-Fārābī's outline indicates that astronomy focuses on bodies (*ajsām*), although it is limited to studying the exterior aspects and properties of the celestial bodies, which it examines in abstraction from matter.[99] It is not expressly suited to inquire into their inner substance. This is the task of physics, although we shall see that there is a considerable degree of overlap between these sciences in the mind of the *falāsifah*. In any case, this explains why al-Fārābī in this passage says nothing about the nature of the orbs and about aether, the simple element of the heavens according to the Peripatetic tradition.

That the investigation into the celestial substance is primarily reserved for physics, not astronomy, is confirmed by another section of the same work. There al-Fārābī explains that the second part of the physical science must investigate "whether simple bodies exist, and if

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[97] Al-Fārābī (1949, 84–86, my translation).

[98] Al-Ṭūsī's *Tadhkirah*, for instance, is divided into these two main sections of *hayʾah*; see Ragep (1993, vol. 1, 36).

[99] See his discussion of this topic and of Aristotle's and Plato's views on mathematical objects in *Burhān* (al-Fārābī 1985c, vol. 4, 68–69).

they do what kind of bodies they are, and how many they are."[100] By "simple bodies," al-Fārābī means not only the four sublunary elements (fire, air, earth, and water), but also aether, the Aristotelian first body or fifth element, which is a simple, incorruptible substance; in fact, Aristotle's discussion of aether in *On the Heavens* 1.2 is explicitly mentioned.[101] According to al-Fārābī, then, astronomy and physics are separate sciences, which nevertheless study two different aspects of the same subject matter, i.e., the celestial bodies. While astronomy studies the exterior aspects of the planets, such as their motions, sizes, and distances, physics inquires into their substance, what they are made of, and how this substance relates to the sublunary elements. It is notable that al-Fārābī's presentation of the subject matter of astronomy and physics agrees with Aristotle's, Geminus', and Simplicius' views on the subject, thus testifying to a continuous philosophical position on this issue. These thinkers made a distinction between the physical study of the cosmos (embodied in the *On the Heavens* tradition) and the astronomical approach, which is basically mathematical and examines the celestial bodies by abstracting them from their matter.[102] This position is also encountered several centuries later in the work of *hayʾah* practitioners such as al-Ṭūsī.[103]

More should be said about al-Fārābī's classification of astronomy as a mathematical science, a view which has a long and diversified history in antiquity. Plato in *Republic* 7, Aristotle in *Metaphysics* 12.8.1073b and possibly in *Physics* 2.2,[104] Ptolemy in *Almagest*, and Simplicius in his commentary on *Physics* 2.2, had all classified astronomy as a mathematical science. This is not to say, however, that these thinkers regarded the relation between mathematics and astronomy in the same way. There are significant differences in their approaches, which are due, among other things, to the status of mathematics in their philosophy. In the case of Plato, for example, mathematics is inextricably linked to

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[100] Al-Fārābī (1949, 96). In this passage, al-Fārābī divides physics into eight parts, the second of which inquires into the bodies that are simple, as opposed to the fifth part that inquires into composite bodies.

[101] Al-Fārābī (1949, 96).

[102] See Aristotle, *Physics* 2.2, as well as Simplicius' (1997, 290,1–293,15) commentary on this passage and his report of Geminus' commentary on a work by Poseidonius.

[103] As Ragep (1993, vol. 1, 39) writes in the case of Ṭūsī, "it was for *ʿilm al-hayʾah* to examine the outward manifestations of simple bodies, whereas it was for *al-samāʾ wa-l-ʿālam* to investigate their essential nature."

[104] Mueller (2006).

his theory of the forms and of an ideal world beyond the realm of sense perception. Mathematical objects have a privileged status due to their immateriality and their ontological proximity to this purely intelligible dimension, although Plato did not go as far as Speusippus in making them the primary entities of his metaphysical doctrine. This explains why Plato in *Republic* argues that astronomy should be studied "by means of problems, as we do geometry."[105] For Plato, astronomy is non-physical and does not deal primarily with bodies; rather, it deals with "true numbers" and "geometrical figures."[106] If this mathematical approach to astronomy is adopted, it can lead us closer to the divine world, and it should play an important role in the curriculum of the guardians.

In the case of Aristotle, his intention in defining astronomy as a mathematical science is grounded in both methodological and metaphysical issues. Aristotle believes that astronomy is primarily interested in the exterior aspects of the celestial bodies, which it studies regardless of their inner nature and composition. In contrast to the physicist, it is the privilege of the mathematician to be able to conceive of objects without their matter. However, unlike Plato and many later Neoplatonists, Aristotle rejected the idea that mathematical objects have an extramental existence. As for Ptolemy, he had a completely different conception of the mathematical dimension of astronomy. He may have been influenced in some ways by the Platonic and Neoplatonic tendency to treat mathematics as a special discipline that bears a close relation to the ideal world of intellect or νοῦς.[107] But Ptolemy's interest in mathematics is overwhelmingly tied to his methodological commitments and his conception of scientific accuracy. Ptolemy undermines physics and metaphysics as cosmological disciplines on the grounds that they provide inaccurate or unverifiable insights into the universe. Mathematics, on the other hand, is able to formulate proofs that are logically compelling and demonstrative in essence. This accounts for Ptolemy's interest in observation and in the accumulated planetary data of past astronomical endeavours. Ptolemy's interest in mathematics is therefore primarily methodological and epistemological, and he sees this science as the foundation of sound astronomical practice.[108]

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[105] *Republic* 7.530b.
[106] *Republic* 7.529d.
[107] See Taub (1993).
[108] For the place of mathematics in *Almagest*, see Pedersen (1974, 47–94).

Al-Fārābī's conception that astronomy is a mathematical discipline is likely to have been informed by the Alexandrian school tradition and may best be described as a hybrid between the Aristotelian and Ptolemaic positions. On the one hand, al-Fārābī broadly follows Aristotle's classification of the sciences and the idea that astronomy focuses on the exterior aspects of the celestial bodies, as *Iḥṣāʾ* makes clear. He also follows Aristotle in rejecting the existence of immaterial mathematical objects outside the human mind (sec. 2.2.2. below). However, he at the same time emphasizes the observational and empirical dimensions of astronomy in *Mūsīqā* (sec. 2.2.1. below), a trend which can be traced to both Aristotle and Ptolemy and which may in addition have been stimulated by the emphasis on scientific observation characteristic of the Arabic astronomical tradition.

At this point, the differences between astrology and astronomy appear clearly. Al-Fārābī regards astronomy as a fully legitimate discipline, which occupies a central place in the philosophical curriculum as one of the mathematical sciences. Although it shares part of its subject matter with physics, it possesses its own aims and mathematical approach. In view of this, it is not surprising that astronomy plays an important role in al-Fārābī's cosmology. This is borne out not only by his writing a commentary on *Almagest*, but also by the large share of astronomical features that he integrates in his metaphysical treatises, especially *Ārāʾ* and *Siyāsah*. In contrast, al-Fārābī rejects most aspects of astrology, because these fall neither within the physical nor the mathematical field. Al-Fārābī therefore distinguishes between astronomy and astrology in terms of their epistemological status, subject matter, and method. Nowhere are there signs of confusion between these two disciplines in his works; on the contrary, the Second Teacher is intent on criticizing one while fully endorsing the other.

From a historical perspective, al-Fārābī's views on astronomy and astrology occupy an intermediary position between the Ancient Greek authors and the Arabic *hayʾah* authors. In maintaining that astronomy and astrology are both part of the same overarching discipline, al-Fārābī is in some sense following an ancient Greek trend that will later be abandoned by the *hayʾah* tradition of the post-eleventh century. Indeed, like *ʿilm al-nujūm*, the Greek terms ἀστρονομία and ἀστρολογία are inherently ambiguous and can mean both astronomy and astrology, depending on the context. As can be seen from the various entries in Liddell and Scott's *Lexicon* and in *Brill's New Pauly*, most Greek authors used these terms very loosely and without distinguishing

clearly between the two disciplines.[109] Al-Fārābī therefore shares this terminological ambiguity with the Greek tradition. But one should not place too much weight on the evidence in *Iḥṣāʾ*, a treatise which draws on the Alexandrian academic tradition and which does not always fully reflect al-Fārābī's views as developed in his other works. We saw that the Second Teacher used a more precise set of terms in parallel to *ʿilm al-nujūm* when he wanted to refer specifically to astronomy or astrology. Unlike the Greek authors, then, al-Fārābī could distinguish mathematical astronomy clearly from astrology both at the terminological and conceptual levels if he wanted to. Moreover, he never embraced astrology the way Ptolemy did in his *Tetrabiblos*. On the contrary, his attempt to refute some aspects of astrology and to redefine the border between astronomy and astrology represent remarkable aspects of his work and a clear break with the Greek tradition. It also anticipated the more sustained critique conducted by Ibn Sīnā and the later *hayʾah* practitioners.

2.2. *The Principles of Astronomy*

2.2.1. *Experience, Observation, and Induction*

One of the main issues addressed by al-Fārābī in the first introductory section of *Mūsīqā* concerns the epistemological foundations of the particular sciences. In order to strengthen his arguments, al-Fārābī compares music to other sciences such as astronomy and medicine, and by doing so provides insight into their method and epistemology as well. Al-Fārābī begins by classifying the sciences in various categories depending on the method required to establish their first principles. There are sciences, he tells us, whose first principles are acquired intuitively and from a very young age. There are other sciences some of whose first principles are acquired in this manner while others are derived from separate sciences. Finally there are sciences that rely on both methods and in addition establish first principles through experience.[110] Al-Fārābī does not provide specific examples for the three categories of sciences he posits. But it becomes clear upon further examination that astronomy belongs to the third category, which means

[109] It would appear that the Greeks did not have a specific term at their disposal to describe the purely mathematical aspects of astronomy until the end of antiquity; see Krafft (2002-) and Hübner and Hunger (2002-).

[110] Al-Fārābī (1960a, 96).

that some of its principles are innate to humans, some are derived from other sciences, whereas still others are reached as a result of experience. In the following paragraphs, I discuss the latter two methods, namely, experience, and the transfer of principles from one science to another.

Al-Fārābī's *Mūsīqā* contains, together with *Burhān*, his most systematic and detailed exposition of the importance of experience, observation, and induction in philosophy, and it is for this reason surprising that this text has attracted so little scholarly attention. Experience (*tajribah*) in particular is treated in some length in the *Mūsīqā*.[111] Al-Fārābī explains that it is grounded in the repeated sensation (*iḥsās*) of facts, and that it occurs when the intellect "acts" (*yaf al*), that is, when the intellect makes a universal judgement on the basis of these facts. As a result, experience can produce certain knowledge and provides us with some of the first principles necessary for demonstration. As al-Fārābī puts it, "the things [*al-ashyāʾ*] acquired through experience [*tajribah*] become first principles [*al-mabādiʾ l-ūlā*] in demonstrations [*barāhīn*]."[112] Throughout his account, al-Fārābī refers to Aristotle's *Posterior Analytics* for support. He even quotes Aristotle to the effect that "sensation [*ḥiss*] is used in the principles of demonstration," but he adds immediately afterward that by "sensation" Aristotle here means the kind of knowledge that leads immediately to experience.[113]

Al-Fārābī provides more specific information on the role of experience in astronomy. At one point he writes that "the situation of this science [the musical science] is like that of other sciences in which many of the principles [*mabādiʾ*] are acquired through the experience of sensibles [*tajribat al-maḥsūsāt*], as in astronomy [*ʿilm al-nujūm*] and most of optics and medicine."[114] And shortly afterward, he adds that "many of the principles of astronomy are acquired by the observer as a result of an act of sensation through observations by means of instruments [*kathīr min mabādiʾ ʿilm al-nujūm taḥṣulu li-l-nāẓir fīhi ʿan al-iḥsās bi-l-arṣād bi-l-ālāt*]."[115] According to al-Fārābī, then, the

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[111] Al-Fārābī (1960a, 92–96 in particular). *Tajribah* corresponds to Aristotle's ἐμπειρία, which is described in several of his works, for instance in *Prior Analytics* 46a18-21 and *Posterior Analytics* 100a3-9. Al-Fārābī and Ibn Sīnā developed their own concept of experience, which plays a special role in their philosophy; see McGinnis (2003 and 2008) and Janssens (2004).

[112] Al-Fārābī (1960a, 95–96, my translation, as well as all forthcoming passages of this work).

[113] Al-Fārābī (1960a, 96).

[114] Al-Fārābī (1960a, 100).

[115] Al-Fārābī (1960a, 101).

astronomer may derive astronomical principles from the "experience of sensibles" and from "instrumental observations." A similar point appears in *Burhān*, where al-Fārābī describes experience (*tajribah*) as a source of knowledge for mathematical astronomy (*ʿilm al-nujūm al-taʿlīmī*).[116]

Janssens argues in his article "Experience in Classical Arabic Philosophy" that experience and observation are two different concepts for al-Fārābī.[117] He points out that experience has a claim to universal knowledge, and he adduces a number of convincing passages from al-Fārābī's works to buttress this point. But Janssens on the other hand does not define observation, nor does he give the Arabic term that would correspond to this concept in al-Fārābī's works. In fact, it would seem that al-Fārābī does not systematically articulate a theory of observation in the works studied by Janssens and in *Mūsīqā*. True, in the latter work, he refers to the "instrumental observations" (*al-arṣād bi-l-ālāt*) of the astronomers, but it is unlikely in my view that *arṣād* here refers to a full-blown theory of observation in the way that *tajribah* refers to a theory of experience.

On the other hand, in *Mūsīqā* and in his logical works, al-Fārābī consistently distinguishes experience (*tajribah*) from induction (*istiqrāʾ*) in a manner reminiscent of the other passages discussed by Janssens.[118] What, then, is the difference between these two concepts? As Janssens explains, experience involves an act of the intellect which can extract universal knowledge from specific events or facts and lead to certainty, whereas induction cannot provide certain knowledge.

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[116] Al-Fārābī (1985c, vol. 4, 71).

[117] Janssens (2004, 50): "It is clear that experience is not opposed to observation, but is closely linked with it: they both pay special attention to things, or events. But experience transcends observation, in that, contrary to the latter, it does not simply notice particulars, but in addition tries to establish a kind of universality out of a number of particulars."

[118] Al-Fārābī (1960a, 94–96). This passage of *Mūsīqā* may have been inspired by *Posterior Analytics* 1.31, where Aristotle explains that sense perception *per se* cannot lead to certain knowledge and demonstration. See also Aristotle's discussion of induction in *Prior Analytics* 2.23, which he contrasts to demonstrative syllogisms. It is interesting that Ibn Sīnā in *Burhān* also provides an elaborate discussion of the distinction between induction and experience in connection with the acquisition of first principles; see the insightful articles by McGinnis (2003 and 2008), which focus on Ibn Sīnā's elaborations on these two Aristotelian concepts and their place in his philosophy. In many respects, such as their mutual endorsement of experience as a valid method of investigation, al-Fārābī's and Ibn Sīnā's accounts share many parallels.

"Experience," says al-Fārābī in *Burhān*, "is what produces certitude of knowledge [*al-yaqīn*] through a universal judgement [*bi-l-ḥukm al-kullī*]."[119] The role of intellect in experience is also underlined in *Mūsīqā*, which defines *tajribah* as "the determination of the sensation of various things a repeated number of times in order that the intellect may act with a special act and reach certainty."[120] It is not completely clear in this quotation what this "special act" (*fiʿl khāṣṣ*) of the intellect is supposed to be, but when juxtaposed to the previous passage, one may conclude that it consists of a rational judgment (*ḥukm*). Confirmation of this appears in the definition of *tajribah* found in al-Fārābī's *Talkhīṣ jawāmiʿ kitāb al-nawāmīs li-Aflāṭūn*, which closely mirrors the one in *Burhān*: "the meaning of experience is the attentive consideration of the particulars of a thing, more precisely forming a judgment about the thing's universality inasmuch as experience finds that universality in these particulars."[121] The "special act" of the intellect in experience, then, is to form a judgment of the particular sensations and extract a universal meaning out of these particulars that represents certain knowledge. In contrast to experience, induction does not lead to universal, certain knowledge, and in al-Fārābī's view it seems closely related to observation and the gathering of data.

Experience is important both in the practical sciences, where it produces phronesis (*taʿaqqul*), as al-Fārābī suggests in *Kitāb al-millah*,[122] and in the theoretical sciences, where it fulfills an epistemological function in the acquisition of certain knowledge. Yet it is difficult to apply al-Fārābī's comments on induction and experience to astronomy, and he provides no clue as to how one should do so. In spite of this, it is possible that he conceived of induction in astronomy as being limited to, or equivalent to, observation, the "instrumental observations" conducted by the astronomer, which after some time form the basis on which experience can operate. A possible example of this occurs when the astronomer, having observed the sun, moon, and stars a repeated number of times, is able through experience to anticipate some of their motions.

A further point of interest in *Mūsīqā* is the distinction between the theoretical and practical sides of astronomy. The theoretical astronomer, al-Fārābī tells us, need not know how to use astronomical instruments

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[119] Al-Fārābī (1985c, vol. 4, 25,2–3), translated by Janssens (2004, 52).
[120] Al-Fārābī (1960a, 95).
[121] Al-Fārābī (1998, 124) translated by Janssens (2004, 50).
[122] Janssens (2004, 48).

as long as he can rely on someone else to do the observations for him.[123] It is not obvious whether experience is meant to correspond to theory and observation or induction to practice, but what is clear on the other hand is that according to al-Fārābī, astronomical theory depends on practice and on the empirical collection of data. If for some reason, al-Fārābī explains, the theorist is not able to benefit from the help of an observer or does not possess the required technology to carry out the observations himself, then he must rely on the findings of his predecessors and can only provide limited theoretical insight into his field of research. Thus, although al-Fārābī distinguishes theory and practice and values the former more than the latter, he admits that theory can achieve only limited progress if it is not supported by adequate practice and observation.

The emphasis on experience found in *Mūsīqā* also appears in a cosmological context in other works by al-Fārābī. In one of the two treatises on astrology already discussed, al-Fārābī explains that experience is necessary to understand the effects of the celestial bodies on sublunary existents, especially the manner in which the celestial bodies transmit heat to plants and other organisms.[124] Experience thus enables valid astrological inquiries to take place, i.e., those that study things that occur with regular frequency. Finally, the epistemological importance of experience is highlighted in *K. al-millah*, where it is presented as a source of knowledge for the practicing physician.[125] Finally, *Risālah*

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[123] Al-Fārābī (1960a, 100–101). *Burhān* (al-Fārābī 1985c, vol. 4, 75) also contains an interesting section on the relation between the practical and theoretical dimensions of the sciences and mentions astronomy as an example.

[124] Al-Fārābī (1976, sec. 3–4) translated by Druart (1979, 48–50).

[125] Al-Fārābī (2001a, 105): "Clearly, he [the physician] could not have acquired this determination [how to cure a particular person] from the books of medicine he studied and was trained on, nor from his ability to be cognizant of the universals and general things set down in medical books, but through another faculty developing from his pursuit of medical practices with respect to the body of one individual after another, from his lengthy observation of the states of sick persons, from the experience acquired by being occupied with curing over a long period of time, and from ministering to each individual." This passage may be based on Aristotle, who also uses the medical art as an example in *Metaphysics* 1.1.981a1 ff. Al-Fārābī's views on the method of medicine probably shared many parallels with his conception of the other particular disciplines, although they are difficult to reconstruct due to the lack of extant evidence. One of his writings on the various branches of the medical art—whether originally a part of *Iḥṣā'* or an independent treatise is unclear—influenced later generations of Jewish scholars, including Maimonides. For this work and for a discussion of al-Fārābī's views on medicine, see Plessner (1972), Stroumsa (1993), and Zonta (1995). It should be noted that unlike Abū Bakr al-Rāzī and later Ibn Sīnā, who were famous physicians, al-Fārābī does not seem to have devoted much time to the study and practice of medicine.

fī l-khalāʾ shows that al-Fārābī himself did not hesitate to carry out practical experiments to solve physical questions such as the existence of the void.[126]

The texts discussed above show that al-Fārābī's conception of experience had a wide application, which in any case transcended the astronomical field and extended into many other aspects of his philosophy. Al-Fārābī regarded experience and induction as important features of the philosophical method—including the astronomical method—and this in spite of the essentially mathematical and abstract nature of astronomy. This feature can be explained partly by the impact of *Posterior Analytics*, which is quoted several times in *Mūsīqā*. The importance this text played in shaping al-Fārābī's methodology with respect to the particular sciences cannot be underestimated, and it appears clearly when he writes that "the first principles of certain demonstrations in every science only reach the soul through the sensation [*iḥsās*] of individual and particular things, as has been shown in the *Posterior Analytics* [*al-anālūṭīqā l-akhīrah*]."[127] It is probably al-Fārābī's thorough acquaintance with this text that can best explain the main methodological differences between him and his predecessor al-Kindī. One may also surmise that this text contributed to the conceptual and epistemological differentiation al-Fārābī made between astronomy and astrology.

Al-Fārābī's discussion of experience, observation, and induction in connection with astronomy has several precedents in ancient philosophy and science, which should be discussed briefly. Aristotle alludes to the importance of heavenly observations in Book Lambda 8.1073b1-20, a passage which expresses the view that astronomy undergoes periodic progress thanks to the gradual accumulation of astronomical data. An even more striking precedent occurs in *Prior Analytics* 1.30.46a19-22, where Aristotle states that "astronomical experience supplies the principles of astronomical science."[128] In Ptolemy's *Almagest*, observation is defined as one of the methodological pillars of astronomy, and one on which mathematical theories rely.[129]

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[126] This text has been edited and translated into English (al-Fārābī 1951).

[127] Al-Fārābī (1960a, 92).

[128] Translated by A. J. Jenkinson (in Aristotle 2001).

[129] Ptolemy (1984, 1.1 H8) alludes to the work of previous scientists and the importance of empiricism; 1.2 H9 refers more directly to the role of observation: "We shall

As for the Arabic world, H. Wiesner has stressed the important function that sense perception, induction, and experience play in al-Kindī's cosmology.[130] Furthermore, historians of Arabic astronomy have convincingly shown that Muslim astronomers not only inherited Ptolemy's outlook, but also developed it considerably, placing new emphasis on the value of precise observation. This trend flourished with greater vigor after the eleventh century and culminated in the achievements of the Marāgha School during the thirteenth and fourteenth centuries. However, it is also perceptible at an earlier stage. Already during the ninth and tenth centuries, Thābit ibn Qurra, al-Battānī, and al-Farghānī were scrutinizing the heavens, and their works show that they understood the value of precise observations in advancing astronomical knowledge.[131] Observational programs were carried out during this period, such as those in Damascus and Baghdad under the reign of al-Maʾmūn, which allowed for accurate and systematic surveys of heavenly motions to be made. As a result, Arabic astronomers corrected or refined a significant amount of the Ptolemaic data they inherited.

In light of the foregoing, it is not surprising that al-Fārābī incorporates experience and observation in the astronomical methodology. It is clear that he considers astronomy to be, at least partially, an empirical science, which relies on the accumulation of data through observation and experience. Particularly noteworthy is his mention of "instruments" (*ālāt*), which betrays a keen interest in the quantitative dimension and practical side of the astronomical science. This emphasis on the empirical aspect of astronomy and its gradual development as a science parallels al-Fārābī's views on the rise of philosophy as exposed in *Ḥurūf* and *Fī ẓuhūr al-falsafah*.[132]

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try to provide proofs in all of these topics by using as starting points and foundations, as it were, for our search the obvious phenomena, and those observations made by the ancients and in our own times which are available" (translated by G. J. Toomer); see also 4.1 H266, and Goldstein (1997, 1–2).

[130] Wiesner (1993, 35–38).

[131] For the role of observation in Arabic astronomy, see Goldstein (1972), Sabra (1971 and 1998, 290 ff.), Morelon (1994), Saliba (2007, ch. 3), and Ragep (2010).

[132] The latter text, which is conveyed in Ibn Abī Uṣaybiʿah's *ʿUyūn al-anbāʾ* (1965, 604), has been translated by F. Rosenthal (1975, 50–51); see also Rescher's comments (in al-Fārābī 1963). As for the historical section of *Ḥurūf*, see al-Fārābī (1970, part 2, 131–161).

2.2.2. *Astronomy and Mathematics*

It was shown previously that al-Fārābī classifies astronomy as a mathematical science in *Iḥṣāʾ*. This classification is mirrored in other texts as well. In *Naṣṣ al-tawṭiʾah*, al-Fārābī divides philosophy into four parts: mathematical, physical, metaphysical, and one which he calls *al-ʿilm al-madanī*. Astronomy, or *ʿilm al-nujūm*, is comprised in the mathematical part. As for logic, it is merely a tool (*ālah*).[133] In *Taḥṣīl*, astronomy is also defined as one of the mathematical sciences alongside arithmetic, geometry, optics, music, statics, and mechanics, in a way reminiscent of *Iḥṣāʾ*.[134] This same passage of *Taḥṣīl* provides additional valuable information on how astronomy fits within the broader philosophical education and on its status within the mathematical field. Al-Fārābī explains that students should start by studying those mathematical disciplines whose objects are completely removed from matter and consist of pure numbers and magnitudes, i.e., arithmetic and geometry. They are then encouraged to descend to those mathematical sciences whose objects are embodied in matter, such as music, astronomy, and mechanics. Although al-Fārābī does not elaborate on this point, the merit of this method is clearly that students can grasp the abstract and universal laws of mathematics without worrying about how they relate to material bodies. Once mastered, these mathematical laws and concepts can then be applied to specific groups of bodies and to particular objects. In other words, the student shifts from pure mathematics (geometry) to the various branches of applied mathematics, such as music, astronomy, and mechanics. One notices that this method is essentially deductive and proceeds from abstract entities to concrete beings. It is one of two methods outlined by al-Fārābī in *Taḥṣīl*, the other being the physical method, which is analytical and proceeds from corporeal beings to their principles.[135]

But what is the place of mathematics in the method of astronomy? Since al-Fārābī's commentary on *Almagest* has not survived, it is difficult to answer this question with any precision, nor is it possible to reconstruct any of his planetary models. In spite of this, a few hints throughout his corpus shed some light on his conception of mathematics and on its role in the astronomical method. In *Burhān*, the Second Teacher explains that some of astronomy's principles are derived from

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[133] Al-Fārābī (1985c, vol. 1, 58–59).
[134] Al-Fārābī (2001c, 18–20).
[135] Al-Fārābī (2001c, 19 ff.).

mathematics, or, more precisely, from geometry (*ʿilm al-handasah*).[136] Al-Fārābī does not elaborate on this brief statement, but he probably had in mind such fundamental principles as the perfection of the circular shape, for instance, which was widely recognized by Greek and Arabic mathematicians. In addition, astronomy relies on basic geometrical figures such as circles, lines, and points to construct its models of planetary motion, the epicycles and eccentrics. Hence, the theorizing of planetary motions and the representation of mathematical models to explain them would not be possible without the principles of geometry.

Another key aspect of al-Fārābī's conception of mathematics can be extracted from *Burhān* and *Aghrāḍ*. In these works, al-Fārābī explicitly defends the view that mathematical entities can only be abstracted from matter in the human mind, but not in reality. When comparing metaphysics and mathematics in the latter work, al-Fārābī states that

> although mathematics is higher than natural science—since its subjects are abstracted from matter—it most certainly should not be called the science of metaphysics because its subjects are abstracted from matter only by human imagination, not actually.[137]

This statement indicates that although al-Fārābī regarded mathematics as a useful tool to investigate the world around us and as a science possessing its own method and subject matter, he did not, on the other hand, endow mathematical objects with a special metaphysical status or value. His view seems to have been informed by the scientific method of Aristotle and Ptolemy, rather than by the metaphysics of the Platonists and Neoplatonists, who had often elevated mathematical numbers to a divine or quasi-divine status. In this respect, al-Fārābī departs not only from these Greek thinkers, but also from al-Kindī, who was apparently influenced by Proclus' commentary on Euclid's *Elements*, and according to whom mathematical objects possess an intermediary position between physical objects and intelligible beings.[138] In contrast, and as G. Freudenthal has shown, al-Fārābī endeavoured to develop an analytical approach to mathematics for didactic reasons (in addition to the synthetic, deductive method inherited from Euclid), and he strongly

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[136] Al-Fārābī (1985c, vol. 4, 65).

[137] McGinnis and Reisman (2007, 79); for *Burhān*, see al-Fārābī (1985c, vol. 4, 68–69).

[138] See the interesting article by Gutas (2004a, especially 204–205, 208) on the role of mathematics in al-Kindī's philosophy.

believed in the pedagogical virtue of proceeding gradually from concrete physical bodies to more abstract geometrical entities.[139] Even in the case of mathematics, then, al-Fārābī's approach is grounded in the physical world and takes concrete bodies as its starting point. These remarks go hand in hand with the emphasis placed on experience and observation and on the quantitative aspect of astronomy, which were discussed in the previous section. They help to explain the intermediary position of mathematics between physics and metaphysics in al-Fārābī's philosophical curriculum.

2.2.3. *Astronomy and Physics*

The role of physics in the cosmological inquiry and its relation to astronomy were alluded to previously, but it is worthwhile providing additional insight into this important question. According to al-Fārābī, physics studies the realm of corporeal beings, which may also be defined as the world (*al-ʿālam*) and nature (*al-ṭabīʿah*).[140] The world or nature consists not only of all the sublunary hylomorphic beings, but also of the heavenly bodies, that is, the orbs, stars, and planets. Hence, the simple celestial substance and its properties fall within the scope of physics. As al-Fārābī writes, physics studies "the heavens and its various parts as being made of a certain one matter [*māddah mā fīhā wāḥidah*]."[141] This information, together with the fact that al-Fārābī defends Aristotle's theory of aether in an extant treatise, *Al-radd ʿalā Yaḥyā l-Naḥwī*, indicates that at least during one period of his life, the Second Teacher endorsed the Aristotelian view that the heavens are made of a special, simple element, and that the study of this substance falls within the perview of natural philosophy.

Al-Fārābī's method with respect to celestial physics and its importance for astronomy can be further fleshed out by relying on some of his comments in *Taḥṣīl*. In one passage, al-Fārābī explains that the method of the theoretical sciences relies on investigation (*faḥṣ*) and inference (*istinbāṭ*), techniques through which the principles of things

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[139] Freudenthal (1988 and 1990).

[140] The world comprises all the corporeal, perceptible beings, and excludes the immaterial beings. Al-Fārābī does not use a specific Arabic term that encompasses both the material and immaterial existents.

[141] Al-Fārābī (1949, 34).

[142] Al-Fārābī (2001c, 13) explains that whereas some primary principles are acquired naturally and from birth, others must be reached through "investigation and

can be established.[142] With regard to physics, the implication is that the philosopher must examine the various classes or genera of bodies in order to identify their principles, which can in turn be used for further investigation. But since all bodies do not belong to the same genus, and since some are more knowable than others, the philosophical method must proceed through inference from those bodies that are more knowable to us to those that are less knowable. Accordingly, the philosopher begins by studying the simple elements, then minerals and plants, then irrational animals, and, finally, rational animals. But in doing so he should not limit himself to the principles of one genus; rather he should strive to give an account "of the principles of its principles, and of the principles of the principles of its principles, until he arrives at its ultimate corporeal principles."[143]

This explains why the philosopher does not begin with the study of the celestial bodies directly, but rather with the study of sublunary bodies, which are the closest to human experience. It is only after having acquired knowledge of these perishable bodies that he may turn his attention to the heavens. At this point, he may rely on different techniques. One is analogical and consists in transferring certain propositions applicable to the sublunary bodies to the celestial bodies. This is justified on the grounds that all of these beings share a common corporeal nature. In addition to this analogical approach, observation also plays a key role, since the philosopher may draw certain physical propositions from the perceived regularity and harmony of the celestial motions. One notices in this respect that observation and experience are concepts used both in the astronomical and physical method, albeit to different ends: in astronomy, they are a starting point for the accumulation of data and the construction of planetary models, whereas in physics they lead to the formulation of key principles (e.g., the perpetual heavenly revolutions point to the existence of a special element possessing circular motion by nature).

According to al-Fārābī, the astronomers are dependent to some extent on the findings of the natural philosophers and on some of the principles established in celestial physics in the manner described above. Indeed, he mentions in *Mūsīqā* another source—apart from

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inference" (*faḥṣ wa-instinbāṭ*). Although he does not mention experience (*tajribah*) in this passage, it clearly plays a role in the process of acquiring the other principles, as was discussed with respect to *Mūsīqā*. The two texts can be read side by side and fruitfully compared.

[143] Al-Fārābī (2001c, 21).

experience, observation, and geometry—from which the principles of astronomy are derived, namely, natural philosophy. As he writes:

> Moreover, the case when we are unable to perceive certain harmonies is like the case in which many of the sciences have their first principles [*mabādiʾhā l-uwal*] proven in other sciences, and the practitioner of this science takes an accepted principle which has been established in these [other] sciences. When he is asked to prove it, he refers to the specialists of these sciences. This is what the astronomer [*munajjim*] does when he wants to explain the causes [*asbāb*] of the various motions of the celestial bodies that appear through observation [*arṣād*]. He can only explain these causes, such as the eccentrics and epicycles [*mithl al-dawāʾir al-khārijah al-marākiz ʿan markaz al-ʿālam wa-aflāk al-tadwīr*], when it is posited that these planetary motions are in themselves regular [*mustawiyyah*]. He is not able to prove [*laysa yumkinu an yatabayyana*] this at all in astronomy, but only by borrowing accepted [premises] [*musallamatan*] from the natural scientists.[144]

This passage explicitly and vividly stresses astronomy's dependence on physics. It does not, on the other hand, describe in any detail the kind of premises and principles that are borrowed from natural philosophy, although al-Fārābī does provide a hint when he mentions that the celestial motions are regular (*mustawiyyah*). The assumption, which is not spelled out in the text, is that the heavens are made of a simple element that possesses a unique motion, namely, circular motion, which, in its constancy and harmony, befits the divine or semi-divine nature of the heavens. The idea of circular motion, which harkens back to Plato's *Timaeus*, was elaborated in full by Aristotle in *On the Heavens* and subsequently became one of the fundamental philosophical assumptions underlying the works of many ancient and medieval astronomers.

More specifically, al-Fārābī probably had *On the Heavens* 1.2-4 in mind when writing this passage of *Mūsīqā*, in which he implicitly accepts the correlation between the simplicity of aether and the regularity of circular motion. Al-Fārābī's argument may be reconstructed as follows: astronomy is unable to account for the heavens' regular and uniform motions if it does not refer to physics, which alone can explain the cause of this phenomenon through a discussion of simple bodies (especially aether) and the principles of motion and rest. What this means is that astronomy is dependent on the natural sciences for some of its principles and is thus not a completely self-contained discipline.

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[144] Al-Fārābī (1960a, 102).

Experience and observation, as well as the mathematical theories built on their data, are insufficient for one to acquire a comprehensive knowledge of the heavenly phenomena. Mathematics is not, as Ptolemy believed, the golden means and the only legitimate method at the disposal of the astronomer, nor is it the only path that leads to divine knowledge. Although problems pertaining to the exterior qualities of the celestial bodies, such as the sizes and distances of the planets, can be solved by astronomers through mathematics alone, knowledge of the causes and devices responsible for celestial motion requires that one transfer physical principles to astronomy, where they are used as first principles (*mabādiʾ uwal*, which correspond to the Greek ἀρχαί). Only then can one account for the causes (*asbāb*) of celestial motion, a term which reveals a concern for causality and in a sense marks the explanatory limit of the astronomical discipline.

The importance al-Fārābī bestows on physical principles in astronomy has one further implication with respect to his method. It suggests that he has in mind an astronomical account that is not purely abstract or geometrical, but rather in accordance with physical reality, and which integrates some of physics' results regarding the corporeality of the orbs. This is vindicated by the fact that al-Fārābī considered the celestial orbs and the various devices, such as the eccentrics and epicycles, to be concrete, corporeal entities. This viewpoint, which transpires in his general account of the structure of the heavens in *Ārāʾ*, will be discussed at greater length in the next chapter.

Al-Fārābī's view that astronomy is dependent on physics is likely to have been shaped by some of the ancient sources that reached him.[145] Aristotle in *Physics* 2.2 provides a discussion of the relation between astronomy, physics, and mathematics, which became a *locus classicus* for later reflections on the subject. According to the traditional interpretation (illustrated in Ross' commentary), Aristotle concludes that astronomy is more physical than mathematical, but this view has recently been challenged.[146] Regardless of whether Aristotle ultimately defines astronomy as a mathematical or physical science, he stresses the connection between astronomy and physics due on the one hand to the corporeality and perceptibility of the heavenly bodies and on the

[145] The most extensive and detailed analysis of the relation between physics and astronomy in antiquity is still to be found in Duhem (1913–59, vol. 1, 468 ff. and vol. 2, 59 ff.); see also Bowen (2007).

[146] Mueller (2006).

other to their having motion. However, Aristotle does not explicitly state in this passage that astronomy is in any way dependent on physics for its principles.

Perhaps more relevant is Ptolemy's attitude toward physics. It is well known that although he claimed to ground his method entirely in mathematics, he at times relied strongly on physics to elaborate some of his cosmological proofs and explanations. This can be seen, for instance, in his treatment of the heavens' sphericity and his mention of aether in section 1.3 of *Almagest*. It is nevertheless in the work of Geminus that al-Fārābī's view finds the closest parallel. Al-Fārābī's general position concerning the importance of natural philosophy in astronomy is mirrored in Geminus' *Introduction to the Phainomena* and especially in his shorter treatise entitled *Concise Exposition of the Meteorology of Poseidonios*.[147] In these treatises, Geminus (or Poseidonios as reported by Geminus) makes the following points. First, astronomy and physics focus on different aspects of the celestial bodies, the former on their motion and exterior characteristics, the latter on their substance. Second, both sciences use a different method to prove the same thing, but because the astronomer cannot know the true nature of superlunary things, he must take his first principles from physics. Finally, there is an emphasis on the study of causes.[148] The dependence of astronomy on physics appears clearly when Geminus writes that "he [the astronomer] must take from the physicist the first principles, that the motions of the stars are simple, uniform, and orderly."[149]

As we have seen, all of these points may be found in al-Fārābī's writings. Al-Fārābī considers that astronomy and physics study different aspects of the same subject matter. He also presents physics as one of the sources from which astronomical principles are derived, and he cautions that astronomers can acquire only partial knowledge of the causes of celestial phenomena. In this regard, al-Fārābī's assertion that the astronomer must "borrow accepted premises from the natural scientists" strikingly echoes Geminus' own statement that the astronomer "must take from the physicist the first principles." These glaring

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[147] Both texts have been translated into English and analyzed by Evans and Berggren (2006); see also Bowen (2007, especially 331 ff.).

[148] Evans and Berggren (2006, 53–58, 252–255); see also Bowen (2007).

[149] Evans and Berggren (2006, 254–255). This quotation resembles al-Fārābī's statement in *Mūsīqā*.

parallels suggest that al-Fārābī is indebted to a particular trend of Greek astronomical theory, which is perhaps most plainly embodied in Geminus. Did al-Fārābī read part of the Arabic translations of Geminus' works? This hypothesis is reinforced by the fact that, as Evans and Berggren write, Geminus' "remarks constitute the clearest statement of this relationship [i.e., between astronomy and physics] we find in any of the Greek astronomical writers."[150] Hence, regardless of the impact that *Almagest* and other Ptolemaic works had on al-Fārābī, in this particular instance the Second Teacher is closer to Geminus than to Ptolemy.[151] This in turn suggests that the Greek astronomical sources transmitted to the Arabic world were probably more diverse than previously believed.

This picture of how physics and astronomy interact is further complexified by the fact that according to al-Fārābī the various sciences can prove the same thing in different ways. In *Burhān*, he explains that astronomy and physics can muster different proofs and use a different method to establish the same conclusion. He provides the example of the sphericity of the heavenly bodies to illustrate this. Al-Fārābī begins by explaining that when a thing has several causes (i.e., the four Aristotelian causes), then these causes can be demonstrated either by one or several sciences. If the four causes cannot be proven by one science, then various sciences might be required to provide knowledge of the different causes. Hence, physics, which studies bodies that are enmattered and possess a principle of motion, and mathematics, which studies objects and qualities abstracted from their matter, can identify different causes of the same existent. This is why al-Fārābī concludes

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[150] Evans and Berggren (2006, 252). Some parts of Geminus' *Introduction to the Phenomena* seem to have been available in Arabic, as Todd (1989, 473) mentions that some of the Hebrew translations were based on Arabic versions. This means that this work or other writings by Geminus could very well have been the direct model for al-Fārābī's conception of the astronomical method.

[151] The differences between Ptolemy's and al-Fārābī's methods are in part rooted in their classification of the sciences. One should remember that according to Ptolemy, mathematics is the highest science because it alone can provide certain knowledge. Physics in contrast is hindered by the preponderance of obscure matter in its subject, while metaphysics cannot reach true knowledge and is marred by its speculative nature. Of all the theoretical sciences, then, mathematics is best equipped to lead to demonstration and to a conception of the divine nature. The key passage appears at the beginning of the *Almagest*: 1.1 H5-H8. In spite of his claims concerning the superiority of mathematics, Ptolemy does not hesitate to borrow certain ideas from physics in order to strengthen his arguments. An example of this occurs in 1.3 H14, when he uses Aristotle's theory of aether and simple body in order to prove the sphericity of the heavens.

that these sciences can collaborate together and study the same object from different angles. According to him, there is therefore no contradiction and opposition between the methods of physics and astronomy. He writes:

> For this reason, it is possible for mathematics and physics to cooperate in [the examination of] a single thing, and for the former to provide a cause, and the latter to provide another cause. In this fashion the sphericity of the world and the sun and the moon is examined by both mathematics and physics.[152]

This statement conveniently encapsulates al-Fārābī's belief in the cooperation of physics and astronomy. It also goes hand in hand with what was said previously concerning the place of astronomy and physics in the philosophical education. According to al-Fārābī, the celestial bodies occupy an intermediary position in the philosophical curriculum and can be studied from two different angles: either by proceeding from pure mathematics to applied mathematics, i.e., from geometry to astronomy, or by pursuing the physical inquiry until it reaches the heavenly world and becomes celestial physics. Both methods are complementary and possess their own didactic merit, although in *Taḥṣīl* al-Fārābī advises students to start with mathematics.[153] This also means that astronomy shares a common boundary with celestial physics, for it is at the level of the celestial bodies that the mathematical and deductive method of the former comes in contact with the analytical and inferential method of the latter.

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[152] Al-Fārābī (1985c, vol. 4, 68, my translation). In using this particular example, al-Fārābī is probably following Geminus as reported by Simplicius in his commentary on *Physics* 2.2, as well as Simplicius himself (1997, 290,25 ff.). But al-Fārābī's account differs in one important respect from the one found in Simplicius. According to Geminus, the mathematician is not interested in causes: "the former [the physicist], with an eye to productive power, often touches on causes. But the latter [the astronomer], when he is constructing proofs from what impinges on a heavenly body from outside itself, does not pay any great attention to causes, as for example when he is presenting the earth or the spherical bodies as spherical" (Simplicius 1997, 292,9 ff.). Al-Fārābī and Geminus thus seem to disagree on this point, for as we have seen, al-Fārābī believes that the physicist and astronomer both give an aetiological account of the sphericity of the heavenly bodies and the world, although they examine different causes. Whereas Geminus refers only to physics and says nothing about metaphysics, al-Fārābī, as will be shown shortly, describes the latter as the ultimate cosmological discipline on which the particular sciences, including astronomy, must rely.

[153] Al-Fārābī (2001c, 18,10 ff.).

The previous analysis should encourage us to re-examine some aspects of al-Fārābī's affiliation to the Aristotelian, Platonic, and Neoplatonic traditions. In his description of the astronomical method, al-Fārābī appears as a thorough Aristotelian, and more specifically, as a careful reader of *Posterior Analytics*, although I endeavoured to show that he was also influenced by the theories of ancient astronomers, such as Geminus and Ptolemy, as well as by the development of Arabic astronomy. Al-Fārābī attempted to apply some of Aristotle's methodological ideas to particular sciences such as music and astronomy, and his general conception of the classification of these sciences is indebted to this work. He is one of the earliest thinkers in Arabic thought to emphasize the importance of observation and experience. He clearly perceived the significance of the empirical approach in the development of the astronomical discipline and reflected deeply on the relation between scientific practice and theory.[154] Al-Fārābī here departs markedly from many Platonists and Neoplatonists for whom all true knowledge consists of insights into the intelligible and immaterial world and who in general discarded the realm of sense perception. This attitude can be witnessed in connection with astronomy in Syrianus' commentary on *Metaphysics* and in the opening pages of Proclus' *Hypotyposis*, two texts which contrast markedly with al-Fārābī's position.[155]

2.3. *The Primacy of Metaphysics and its Impact on Cosmology*

The previous section stressed the important role played by astronomy and physics in the cosmological inquiry as well as the interrelatedness of these sciences. According to al-Fārābī, however, these disciplines can only yield limited insight into the heavens, because the ultimate principles of existence and causes of the celestial bodies are immaterial and therefore can be studied neither by natural philosophy, which

[154] These conclusions agree with the recent research on the scientific methodology of Muslim thinkers conducted by McGinnis (1993) and Ragep (2010), who emphasize the importance of induction, experience, and observation in the works of Ibn Sīnā and Arabic astronomers respectively. Their studies also stress the discernment with which the Muslims criticized and tested the body of knowledge they inherited from the ancient Greeks, an attitude which was partly due, as Ragep explains, to theological and social reasons.

[155] See Syrianus (2008, 24,4 ff.) and Lloyd (1978, 207) for a translation of the relevant passages and a discussion of Proclus' *Hypotyposis*.

studies material bodies, nor by mathematics, which studies objects existing only in the human mind. Metaphysics on the other hand can provide knowledge of these immaterial causes and thus bring the inquiry into the celestial substance to its completion.[156] As al-Fārābī explains in *Falsafat Aristūṭālīs* on behalf of the Stagirite,

> He [Aristotle] had to investigate also whether the substances of the heavenly bodies consist of a nature or a soul or an intellect, or something else more perfect than these. These matters are beyond the scope of natural theory. For natural theory includes only what is included in the categories; and it has become evident that there are here other instances of being not encompassed by the categories: that is, the Active Intellect and the thing that supplies the heavenly bodies with perpetual circular motion.[157]

In this passage al-Fārābī intimates that metaphysics is necessary for two things: to define the true substance of the celestial bodies (which could very well be an immaterial principle like intellect) and to identify their cause of motion, which is described as a "thing" exterior to them. Here we see that the physical definition of the orbs and planets as simple bodies put forth by the Aristotelian tradition does not stand for a full definition, since aether constitutes only the material aspect of their substance, which in addition may include immaterial principles such as soul or intellect. On al-Fārābī's reckoning, knowledge of the heavens' substance and causes must depend on metaphysics, which alone can investigate these immaterial principles.

The approach underlying this view is explained in more detail in *Fuṣūl*, where al-Fārābī advises the student of theoretical philosophy to "[ascend] little by little in the things that need matter to be understood and conceived of until he comes to the celestial bodies." Then he adds:

> When he ends up at the celestial bodies, the rational soul, and the active intellect, he [the philosopher] transfers again to another rank. So it is necessary for him to inquire theoretically into the principles of their existence until he becomes aware of principles that are not natural. … He also comes to a midpoint between two sciences—the science of natural things and the science of what is after the natural things—in the ranking of investigation and instruction.[158]

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[156] More precisely, the part of metaphysics that deals with immaterial substances; see *Iḥṣāʾ* (al-Fārābī 1949, 99) and Druart (1987a, 39).

[157] Al-Fārābī (2001c, 129).

[158] Al-Fārābī (2001a, 61–62).

That the heavenly bodies mark the boundary between material and immaterial beings and thus between physics and metaphysics is also underlined in *Taḥṣīl*, where one finds the following statement:

> When one finally comes to enquire into the heavenly bodies and investigate the principles of their being, this inquiry into the principles of their being will force him to look for principles that are not natures or natural things, but beings more perfect than nature and natural things. They are also not bodies or in bodies. Therefore one needs another kind of investigation here and another science that inquires exclusively into beings that are metaphysical. At this point he is again standing between two sciences: the science of nature and the science of what is *beyond* natural things in the order of investigation and instruction and *above* them in the order of being.[159]

These passages go hand in hand with another passage in *Fuṣūl*, in which the celestial bodies are said to represent a distinct genus of existents whose status is intermediary between metaphysical beings and material beings. As al-Fārābī writes, "There are three genera of existing things: those devoid of matter, celestial bodies, and material bodies." And shortly after, he adds that "there are three worlds: spiritual, celestial, and material."[160] The latter statement may strike one as somewhat peculiar, because the orthodox Peripatetic tradition divides the world in two dimensions, the superlunary and sublunary. This "two-sphere universe," as T. Kuhn has called it, is one of the most recognizable features of medieval Aristotelian cosmological models. But al-Fārābī is asserting here in a somewhat Platonic manner that the celestial bodies represent an intermediary world between the world of intelligible beings and that of corruptible existents.[161] Al-Fārābī's use of the term "world" (*ʿālam*) should probably not be taken literally, but it does underscore the special status of the celestial bodies and their remoteness from the realm of generation and corruption. Although the notion of an intermediate celestial world is proper to this passage of *Fuṣūl*, the idea that the celestial bodies constitute a distinct category or genus of existents is found in al-Fārābī's other writings.

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[159] Al-Fārābī (2001c, 21–22).

[160] Al-Fārābī (2001a, 45).

[161] This passage of *Fuṣūl* is also reminiscent of Neoplatonic cosmology, especially that of Proclus. As Siorvanes (1996, 267) explains, for Proclus "the heavenly objects may be divine, but they stand between the intelligible and the sensible." They are "intermediaries" (278).

In *Siyāsah*, which is also known by the more appropriate name *Mabādiʾ l-mawjūdāt*, the celestial bodies constitute one of six genera (*ajnās*) of bodies.[162]

The main ideas that emerge from these passages are that the heavenly bodies occupy an intermediary position between the natural world and the intelligible world, and that it is necessary for this reason to rely on metaphysics if one wants to obtain a complete definition of their substance (*jawhar*) and principles (*mabādiʾ*). The need for metaphysics in this case is all the more conspicuous, given that al-Fārābī endows the celestial bodies with intellects (*ʿuqūl*) that reflect on the higher immaterial principles that are the separate intellects (ch. 2, 2.1-5.). Hence, although physics and metaphysics should both be employed in the cosmological project, only the latter science can provide complete knowledge of the fundamental principles of the cosmos, which are immaterial and therefore lie beyond the realm of nature.

This notion of the primacy of metaphysics in the cosmological inquiry also has a direct bearing on the astronomical method. Al-Fārābī's view on this matter can be reconstructed not from *Mūsīqā*, but rather from his logical treatises and particularly *Burhān*, which is interested in the rules governing scientific demonstration and in defining the interrelation of the sciences. We saw previously that al-Fārābī holds observation and experience in high esteem, since these techniques produce some of the principles of astronomy and also enable the development of this science through the accumulation of data. However, this empirical method has a limit within cosmology, which is fixed, among other things, by the nature of the subject matter. It is understandable that observation is of no use when the causes of visible phenomena (here the planets and their motion) are by nature invisible and abstract and can only be apprehended intellectually. Accordingly, the study of these causes falls outside the realm of astronomy, but it does have an impact on the kinds of things the astronomer can legitimately seek to know and on the mode in which he knows them, particularly with regard to celestial motion.

This partly explains al-Fārābī's belief that astronomy, like all the secondary or particular sciences (*al-ʿulūm al-juzʾiyyah*), is dependent on metaphysics for some of its principles, since it cannot establish its first principles on its own. Just as astronomy derives some of its premises

[162] Al-Fārābī (1964, 31).

from physics and geometry, so it derives some of its other premises from metaphysics. This view is articulated clearly in al-Fārābī's *Burhān*, which outlines a complex theory of the interrelatedness of the sciences. One key idea is that metaphysics, or "first philosophy" (*al-falsafah al-ūlā*), is the universal science that provides the particular sciences with some of their principles. Al-Fārābī writes that

> the particular sciences [e.g., physics, astronomy] are all below first philosophy, participating in it insofar as all their subjects are below the absolutely existent [*al-mawjūd ʿalā l-iṭlāq*]. This science will employ universal premises that all the particular sciences employ in the way we have described, while the particular sciences employ premises which are demonstrated in that science [first philosophy].[163]

And further on al-Fārābī notes that metaphysics is the science that gives "the highest causes of the existents" (*asbāb al-mawjūdāt al-quṣwā*).[164] These points are echoed in *Aghrāḍ*, where he explains that it is metaphysics that provides the principles and subject matters of the particular sciences.[165]

Furthermore, in *Burhān*, al-Fārābī follows Aristotle's distinction in *Posterior Analytics* 1.13 between knowledge of the fact and knowledge of the reasoned fact, which translates syllogistically into demonstration of the existence and demonstration of the cause, known in Arabic as *inna* and *lima* (or *innī* and *limmī*) proofs.[166] Knowledge or demonstration of the existence is merely knowledge *that* (*anna* or *inna*) something exists, whereas knowledge or demonstration of the cause is

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[163] Al-Fārābī (1985c, vol. 4, 65) translated by Endress (2003, 139, slightly revised); see also al-Fārābī (1985c, vol. 4, 70).

[164] Al-Fārābī (1985c, vol. 4, 70,13–14).

[165] McGinnis and Reisman (2007, 80). It is likely that al-Fārābī's classification of the sciences and his belief that some sciences are subordinated to others was inspired by Aristotle's *Posterior Analytics*, especially 1.5.74a38-1.7.75b20, 1.13.78b35-79a15, and 1.27.87a32-38. Aristotle in general maintains the autonomy of the sciences, but in some passages he also hints at their interconnectedness and seems to subordinate some disciplines to others (e.g., optics to geometry). While he may have been inspired by this work, al-Fārābī nevertheless provides a different classification of the philosophical disciplines. On the one hand, he develops the concept of the "cooperation of the sciences" (*mushtarakat al-ʿulūm*), which is crucial to understanding his methodology and how the first principles are aquired. On the other hand, al-Fārābī devises a pyramidal and highly hierarchical classification of the sciences. He establishes metaphysics as the first universal science, to which all the other particular sciences are subordinated, and in so doing he set a profoundly influential model for subsequent Arabic thinkers.

[166] See Marmura (1990), who provides an overview of the influence of Aristotle's *Posterior Analytics* on Arabic thought.

knowledge *why* (*lima*) this thing exists.[167] Al-Fārābī explains in *Taḥṣīl* that both kinds of demonstration are valuable for the philosopher and produce knowledge.[168] But in *Burhān* he grounds an important part of his exposition on this distinction and argues that it is always preferable for a philosopher to reach knowledge of the cause together with knowledge of the existence, rather than knowledge of the existence alone.

Now, metaphysics is the science which *par excellence* is able to provide this kind of certain knowledge, since it studies the most fundamental causes of being on which all substances ultimately depend. As al-Fārābī writes, "the prior sciences provide the posterior sciences with knowledge of the causes or of the causes and existence together."[169] In turn, this explains why the proper cosmological method must rely not only on particular sciences such as physics and astronomy, but also on metaphysics in order to provide a comprehensive account of the universe that includes a causal explanation of its hidden principles. These principles identified by metaphysics, chief among them being the separate intellects, will be discussed in detail in the next chapter.

Al-Fārābī regards the relation between astronomy, physics, and metaphysics as reciprocal, rather than unilateral, and he believes that the latter can in turn benefit from astronomy and the other particular sciences. Astronomy depends on metaphysics and physics for some of its principles, but it can in return contribute to these sciences by providing them with knowledge of certain existents with which physics and metaphysics also deal. These existents chiefly consist of the planets and orbs, and an example might be the discovery of new stars through astronomical observation, as well as the calculation of their distances, sizes, etc. In this manner, astronomy can contribute to one's knowledge of the existents subsumed under a certain genus, which may be of value to metaphysics as well. On the other hand, astronomy will not be able to explain why this particular star exists, a question which requires an aetiological account that transcends the astronomical discipline.

But more significantly, astronomy may also shed light on the metaphysical beings such as the separate intellects, and particularly on the

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[167] Al-Fārābī (1985c, vol. 4, 26 ff.); cf. his comments in *Taḥṣīl* (al-Fārābī 2001c, 15). For a discussion of these proofs in Aristotle and the later Arabic commentators, including al-Fārābī, see Lettinck (1994, 105–113).

[168] Al-Fārābī (2001c, 16–17).

[169] Al-Fārābī (1985c, vol. 4, 66, my translation).

question of their number. This statement might appear more surprising at first glance, given that the immaterial existents do not fall within the subject matter of astronomy. Yet according to al-Fārābī and later Ibn Sīnā, who follow Aristotle directly on this point, the question of the number of the separate intellects or unmoved movers hinges to some extent on the number of orbs identified by the astronomical discipline.[170] This view is reflected in Ibn Sīnā's statement in *Metaphysics* of *Shifāʾ* that "the ultimate aim in this [metaphysical] science—namely, knowledge of God's governance, knowledge of the spiritual angels and their ranks, and knowledge of the order of the arrangement of the spheres—can only be arrived at through astronomy," and it is also intimated in Themistius' paraphrase of *Metaphysics*.[171] These testimonies are important insofar as they show that the philosophical motivation for practicing astronomy partly stems from the belief that it may contribute to the progress of metaphysical knowledge.[172]

Accordingly, al-Fārābī writes in *Burhān* that "things that are proven in astronomy are used as first premises in metaphysics and physics."[173] And he elaborates on this point shortly afterwards by adding that

> The prior sciences provide the posterior sciences with knowledge of the causes or knowledge of the causes and existence [*wujūd*] together, whereas the posterior sciences provide the prior sciences with knowledge of the existents alone. For example, the art of astronomy provides physics and metaphysics with [knowledge of] many aspects of the existents that are comprised by them.[174]

In this passage, al-Fārābī is following the Aristotelian distinction between proof of the fact and proof of the reasoned fact, although his

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[170] Aristotle in *Metaphysics* 12.8.1073b1 ff. and particularly the conclusion at 1074a14-17.

[171] Ibn Sīnā (2005, 14–15). It is also reflected in a passage of Themistius' paraphrase of *Metaphysics*, Book Lambda, preserved in Hebrew; see Themistius (1999, sec. 8.5, 101): "Si j'ai dit que la science des astres est très unie à la philosophie [i.e., metaphysics], c'est seulement parce qu'elle seule cherche la substance sensible éternelle. Quant au reste des mathématiques, leur recherche porte sur les accidents qui affectent les corps."

[172] It is worth comparing this approach to the Arabic theologians' justification of the practice of astronomy. According to al-Nīsābūrī, for instance, astronomy can help one to perceive the divine order that pervades the cosmos and that testifies to God's glory; see Morrison (2007, 29).

[173] Al-Fārābī (1985c, vol. 4, 66, my translation). The Arabic reads: *fa-li-dhālika tustaʿmalu ashyāʾu tabarhanat fī ʿilm al-nujūm muqaddamāt uwal fī l-falsafah al-ūlā wa-fī l-ʿilm al-ṭabīʿī*.

[174] Al-Fārābī (1985c, vol. 4, 66,14–17, my translation).

emphasis here is between two different kinds of knowledge (*maʿrifah*): knowledge of existence alone and knowledge of existence together with knowledge of the cause. The particular, posterior sciences such as astronomy can benefit metaphysics by providing it with knowledge of certain existents and by formulating demonstrations of the fact, or *innī* proofs. Hence, whereas the premises borrowed by astronomy from metaphysics consist in knowledge of the causes (*asbāb*), the knowledge that metaphysicians derive from astronomy can only be used as "evidential proofs" (*dalāʾil*).[175]

In view of the foregoing, al-Fārābī's conception of the method of astronomy and of how the various sciences relate to one another may be schematized as follows:

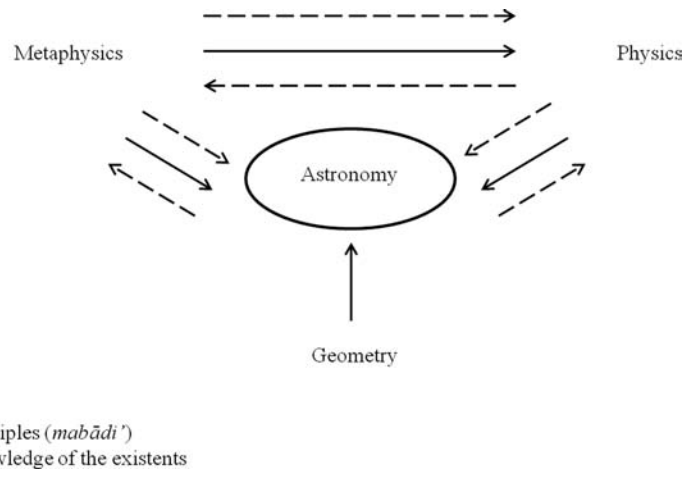

Figure 2: The principles of astronomy and the interrelatedness of the sciences according to al-Fārābī

It should be noted that the application of the *innī* /*limmī* distinction to al-Fārābī's classification of the sciences and to astronomy in particular raises several problems. As J. F. Ragep explains, Arabic astronomers interpreted this conceptual distinction in an idiosyncratic way. "In contrast with Aristotle," he writes, "Arabic mathematical astronomers do not see themselves as giving proofs of the reasoned fact, but rather of the fact. These "facts," however, are not observations but rather the

[175] Marmura (1990, 94).

configuration (*hayʾa*) of the simple bodies."[176] On the one hand, this point seems to correspond to al-Fārābī's position quite accurately. In the passage from *Mūsīqā* cited earlier, al-Fārābī explains that the astronomer by himself cannot explain why the planets have regular, circular motions. As al-Fārābī writes, "he is not able to establish [*laysa yumkinu an yatabayyana*] this at all in astronomy, but only by borrowing accepted [premises] [*musallamatan*] from the natural scientists."[177] Since astronomy is dependent on physics and metaphysics for explaining the causes of celestial motion, it would seem that its capacity for *limmī* proofs is limited or even nil.

On the other hand, in the same passage of *Mūsīqā*, al-Fārābī calls the eccentrics and epicycles "*asbāb*," which suggests that other types of causes underlying celestial motion can be identified by the astronomer. The Second Teacher seems to be alluding here to an astronomical account that transcends the mere observation of phenomena and that can explain *why* motion occurs by relying on the planetary models. This interpretation assumes that the eccentrics and epicycles are bodies invested with a motive power and that they are thus part of the physical reality of the cosmos (see ch. 2, 1.1. and 1.2.). Accordingly, once the astronomer has borrowed the required principles from physics, he can then go on to elaborate his own proofs of why the planets move in particular directions. In astronomical terminology, *sabab* can refer to an 'explanation' of a planet's motion through models such as the epicycles and eccentrics. In this case, however, it is possible that al-Fārābī is using the term *asbāb* with the intention of conveying the dual meaning of 'explanation' and 'cause.' Not only was there a semantic overlap between the two concepts in Arabic philosophy, but al-Fārābī clearly ascribes corporeal existence to the eccentrics and epicycles, thus potentially transforming them into causes of the planets' motions. The latter are not merely abstract devices, but real bodies that play a role in the actualization of planetary motions.

This interpretation is reinforced by the fact that in al-Fārābī's philosophical works, *sabab/asbāb* designates the causes or principles (*mabādiʾ*) of existence of the lower entities. By way of illustration, God is described as a "proximate cause [*al-sabab al-qarīb*] of the existence of the secondary causes [i.e., the separate intellects or *thawānī*]," while

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[176] Ragep (1993, vol. 2, 387) and his discussion of the *innī/limmī* proofs in al-Ṭūsī's astronomy (386–388).

[177] Al-Fārābī (1960a, 102, my translation).

the separate intellects themselves are "causes [*asbāb*] of the existence of the celestial bodies."[178] The term 'cause' surely has a different meaning in the metaphysical and astronomical contexts, in the sense that the eccentrics and epicycles are not principles of existence in the way that the separate intellects are. But the fact that al-Fārābī describes these devices by means of the same term suggests that they may have an efficient role to play in the motion of the planets. In spite of this, it is unclear to what extent the eccentric and epicyclic models developed within the astronomical discipline and adopted by the philosophers represent a proof in the full sense and what their explanatory value is with respect to kinematic causality. Moreover, it is unclear whether the examination of the eccentrics and epicycles *qua* bodies and motive causes should still be considered a part of astronomy and should not rather be viewed as belonging to the field of physics.[179] Further research on these issues in the works of Arabic astronomers and philosophers is a *desideratum*.

2.4. *Al-Fārābī and the Later hayʾah Tradition*

The idea that physics and metaphysics can be a source of astronomical principles is found several centuries later in the works of two of the most important *hayʾah* practitioners, Naṣīr al-Dīn al-Ṭūsī and Muʾayyad al-Dīn al-ʿUrḍī.[180] At the beginning of *Al-tadhkirah fī ʿilm al-hayʾah*, al-Ṭūsī explains that "those of its [astronomy] principles that need proof are demonstrated in three sciences: metaphysics, geometry, and natural philosophy."[181] As was mentioned before, al-Fārābī also believes that these three sciences provide some of the principles of astronomy, and he mentions geometry and physics explicitly. Furthermore, although al-Ṭūsī does not elaborate on the metaphysical principles he has in mind, he subordinates some sciences to others and integrates astronomy in a hierarchy that culminates with metaphysics in a manner reminiscent of al-Fārābī.

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[178] Al-Fārābī (1964, 31).

[179] Indeed, one wonders whether the statement of the philosophers to the effect that astronomy merely "borrows" physical principles is sufficiently adequate to express this state of affairs. This raises the question of why al-Fārābī and many of his contemporaries continued to classify astronomy as a mathematical science, in spite of the heavy reliance of astronomy on physics and the fundamental assumption of the physicality of the orbs.

[180] For the former, see Ragep (1993, 38–46); for the latter, see Sabra (1998, 307–308, 313).

[181] Ragep (1993, vol. 1, 90).

The emphasis placed by al-Fārābī and the *hayʾah* practitioners on the role of physics does not stem only from a methodological concern about how to derive first principles, but also indicates a desire to provide a comprehensive cosmological picture, i.e., one that can simultaneously account for the mathematical theories behind celestial phenomena *and* for the physical arrangement of the orbs and planets. These thinkers believed that the physical laws at play in the superlunary realm had to be understood in order to elaborate a valid astronomical model that would be in agreement with reality.[182] Al-Fārābī and al-Ṭūsī share a common concern for the physicality of the astronomical models they discuss, and both thinkers endow the orbs with concrete existence. As al-Ṭūsī writes: "Restricting oneself to circles is sufficient in the entirety of this science [astronomy] for whoever studies the proofs. However, one who attempts to understand the principles [*mabādiʾ*] of the motions must know the configuration [*hayʾah*] of the bodies [i.e., must understand their physical configuration]."[183] Al-Ṭūsī then goes on to describe the deferent, concentric, and eccentric as orbs (*aflāk*) and the epicycle as a sphere (*kurah*) possessing corporeal existence. He also mentions the surface and thickness of these bodies, thus providing a detailed description of the physical features of his models. Al-Fārābī also provides a description of these celestial bodies in *Ārāʾ*, although it is less detailed and occurs in a different philosophical context.[184]

Hence, al-Fārābī's approach is in many fundamental ways similar to that of these later *hayʾah* practitioners. These thinkers share the view that astronomy derives some of its principles from physics; that a valid astronomical model must exhibit a harmony between mathematical theories and physical principles, which implies a physical interpretation of the heavenly orbs; and that ultimately it is metaphysics that

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[182] In this respect, Arabic astronomers considered that Ptolemy had not successfully synthesized the mathematical theories put forth in *Almagest* and the physical descriptions of the cosmos found in *Planetary Hypotheses*, and they therefore strove to combine both trends in a more thorough synthesis. As Ragep (1990, 210) writes: "In accepting that astronomy was based on both mathematical and physical principles, Arab astronomers reached a rather simple conclusion—the mathematical models had to be consistent with the physical principles." As for Sabra (1998, 300), he defines the *hayʾah* project as follows: "the program consisted in seeking, or urging to seek, a reconciliation between the Ptolemaic "mathematical" hypotheses assumed to be already supported by observational tests … and adopted theories of cosmology and physics or natural philosophy"; cf. Saliba (2007, especially ch. 3).

[183] Ragep (1993, vol. 1, 2.5 [10]).

[184] Al-Fārābī (1985a, 119–135 and 1985b, 69–76).

represents the crowning science under which astronomy is subsumed. They were conversant with *Almagest*, *On the Heavens*, and *Metaphysics* and tried to integrate the various and sometimes conflicting theories expressed in these seminal works into a unified picture of the cosmos. This makes al-Fārābī a link in the long chain that goes from Geminus, Ptolemy, and Simplicius, through al-Bīrūnī and Ibn Sīnā, to al-Ṭūsī, al-ʿUrḍī, and the Marāgha School of the thirteenth and fourteenth centuries. More specifically, there are obvious similarities between the astronomical outlook of Geminus, al-Fārābī, Ibn Sīnā, and al-Ṭūsī, which enable one to perceive some continuity in the way these thinkers conceived of this discipline. If al-Fārābī did not belong to the *hayʾah* tradition proper, he may nevertheless be said to have anticipated and adopted some of the essential features that characterized its later development.[185]

3. *Demonstration and Analogy: A Tension in al-Fārābī's Method*

3.1. *The Evidence for and against Demonstration*

Having clarified al-Fārābī's conception of the interrelatedness of the cosmological sciences and of the place and method of astronomy, I now wish to turn to other methodological and epistemological issues,

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[185] The impact of al-Fārābī's and especially Ibn Sīnā's cosmological views on the post-classical *hayʾah* tradition remains to be studied in detail. In noting these parallels, I do not wish to argue that al-Ṭūsī read al-Fārābī's works, but merely to point out some of the main similarities in their cosmologies and highlight the continuity between the early *falāsifah* and the *hayʾah* authors with regard to their views on the method of astronomy. There are also substantial differences in these thinkers' approach to this subject. To begin with, there is no evidence that al-Fārābī intended to modify or criticize Ptolemy's astronomy in the systematic way that later *hayʾah* practitioners did. Since al-Fārābī's commentary on *Almagest* has not survived, we cannot know whether he was conscious of any shortcomings in Ptolemy's planetary models and whether he believed that it was the task of Arabic thinkers to complete the astronomical project begun by the Alexandrian. Moreover, whereas *hayʾah* practitioners wanted to achieve a synthesis of astronomical and physical theories within a distinct and well-delineated literary genre and discipline, which finds an outstanding example in al-Ṭūsī's *Tadkhirah*, for instance, al-Fārābī, in contrast, addresses astronomical and physical issues in different treatises and by resorting to different disciplines. His synthetic approach therefore appears quite superficial in comparison with the *hayʾah* works. In addition, it should be noted that some post-classical *hayʾah* authors attempted to "free" astronomy completely from its reliance on physical and metaphysical principles. In that sense, they went beyond not only al-Fārābī, but al-Ṭūsī himself, who, as we have seen, emphasized the need for physical principles in astronomy. A brilliant example of this later development is embodied in the fifteenth-century astronomer al-Qūshjī, studied by Ragep (2001).

and in particular to the question of the human capacity to know superlunary phenomena. The previous discussion stressed the primacy of metaphysics in the cosmological inquiry and its unique ability to define the ultimate causes of reality. The questions that now confront us pertain to the epistemological scope of this science and the method deemed appropriate to establish cosmological proofs. What is the place of demonstration (*burhān*) and of the other kinds of philosophical argumentation in al-Fārābī's cosmological works? And can the philosopher ever hope to fully understand the superlunary phenomena?

To begin with, it is necessary to inquire whether, according to al-Fārābī, it is possible to formulate proofs of a cosmological nature, and if so, what kind of proof it is. This is all the more important, given that some medieval thinkers denied the capacity of human reason to solve cosmological aporias, and that some modern historians have questioned al-Fārābī's belief in demonstration. The first point is illustrated by a passage of *Guide* in which Maimonides argues that Aristotle's arguments in *On the Heavens* completely lack the certainty associated with the demonstrative method; and he adds that Aristotle himself was aware of this, yet wanted to convince his audience through rhetorical and dialectical means that the universe is eternal.[186] Maimonides' stance on this particular issue rests on the claim that demonstrative arguments cannot be adduced to prove or disprove such conundrums, which lie well beyond the human ken. As Maimonides writes in the *Guide*,

> it is impossible for us to accede to the points starting from which conclusions may be drawn about the heavens; for the latter are too far away from us and too high in place and in rank. And even the general conclusion that may be drawn from them, namely, that they prove the existence of their Mover, is a matter the knowledge of which cannot be reached by human intellects.[187]

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[186] Maimonides (1963, 2.15.33a-b). This passage is reminiscent of some aspects of Philoponus' criticism of Aristotelian cosmology.

[187] Maimonides (1963, 2.24.54b). Naturally, this passage should not be regarded as Maimonides' last word on the topic, since *Guide*, as is well known, is a multi-layered and somewhat esoteric text. In any case, past scholarship has often portrayed Maimonides as a somewhat radical skeptic; see for instance Pines (1979), who emphasizes the aporetic aspect of Maimonides' thought. This picture, however, has been challenged in favour of a more balanced assessment of Maimonides' attitude vis-à-vis cosmological and metaphysical knowledge; see Kraemer (1991), Ivry (1991), and especially Langermann (1991) and Rudavsky (2000, 24–30) (the last two references also provide a re-assessment of Maimonides' attitude toward astronomy).

Maimonides' criticism of Aristotle raises the important question of the types of proofs and methods used by medieval authors in their handling of cosmological problems. What was al-Fārābī's position and how do Maimonides' comments on the limits of human knowledge relate to his philosophy? There are no statements by al-Fārābī that immediately come to mind that suggest that he shared Maimonides' skepticism concerning cosmological knowledge. Nor is there any indication that al-Fārābī limits demonstration to the mathematical method proper to astronomy, as Ptolemy had. Before we turn to a study of al-Fārābī's works, it should be noted that Maimonides himself provides evidence for the fact that al-Fārābī would not have agreed with him. This is made clear when Maimonides writes:

> However, you know Abū Naṣr's [al-Fārābī's] interpretation of this example, what he made clear with regard to it, as well as the fact that he considered disgraceful the notion that Aristotle could have doubted of the eternity of the world. *He had an extreme contempt for Galen because of the latter's saying that this was an obscure question with regard to which no demonstration is known. As Abū Naṣr holds, it is clear and manifest, being proved by demonstration that the heavens are eternal* whereas that which is within them is subject to generation and passing-away.[188]

According to Maimonides, then, al-Fārābī believed that it is possible to settle the question of whether the world is created *ex nihilo* or is eternal through demonstrative proof. Both thinkers disagree on this crucial point: whereas Maimonides uses philosophical arguments that are as close as possible to demonstration, but which are in essence dialectical or rhetorical, to try to convince the reader and ultimately relies on scripture as the decisive criterion, al-Fārābī believes that it is possible to formulate demonstrative arguments by relying on human reason alone. This, at any rate, is what may be inferred from *Guide*.

Maimonides' testimony is partially vindicated by the information that can be gleaned from al-Fārābī's corpus. We know that al-Fārābī paid particular attention in his works to the various types of argumentation at the disposal of philosophers (such as rhetoric, dialectic, and demonstration) and that he associated each type of discourse with a specific social activity or group, as his commentaries on the *Organon* and his emanationist treatises amply show. In these texts, al-Fārābī carefully distinguishes between demonstration on the one hand, which

[188] Maimonides (1963, 2.15.33b, my emphasis); see also Vajda (1965).

is the privilege of the philosophers, and dialectical, rhetorical, and poetical modes of expression on the other, which are used by theologians and other groups within society. In the following paragraphs, I wish to stress the connection al-Fārābī establishes between philosophy and demonstration and show that in his view cosmological and metaphysical problems could be addressed demonstratively.

In *K. al-jadal*, in a passage which may or may not be the one implicitly referred to by Maimonides above, al-Fārābī describes two ways of approaching the question of the eternity of the world. He writes:

> 'Is the world eternal *a parte ante* [*azalī*] or not?' [*Topica*, 1.11.104b14-16]. … This example he [Aristotle] proposes is very dialectical under one aspect, since when we say "is the world eternal *a parte ante* or not?", insofar as we employ this wording, it is not possible at all that we produce a certain syllogism [*qiyās yaqīnī*], neither of the fact that it is eternal *a parte ante* nor of the fact that it is not eternal *a parte ante*. For our word "the world" is an ambiguous word and, moreover, taken as indefinite. So, if the world is taken in its entirety in such a way, [it will be found to have] many parts, one of which is clearly not eternal *a parte ante*, another such that it is possible to produce about it a syllogism showing that it is eternal *a parte ante*, and another of unclear status. Thus, when we take the world in its entirety, it is sometimes eternity *a parte ante* which is imagined, and sometimes incipience, so that we always produce opposed syllogisms. The only way then is to examine, for each of its parts, whether it is eternal *a parte ante* or not, and in how many ways a thing can be eternal *a parte ante*, and in how many ways it is said to be not eternal. This is the method leading to the production of its demonstration [*wa-hādhā huwa l-ṭarīq ilā muṣādafah burhānihī*], whereas according to the first method, it is not possible to produce its demonstration, the syllogisms produced being opposed syllogisms in each case.[189]

In this passage, which is obviously of primary importance to understand al-Fārābī's method, the author begins by expressing doubt as to whether syllogistic reasoning can solve the problem of the eternity of the world. If taken as a whole, this question can only lead the inquirer into conflicting opinions, and this is the problem of the dialectical approach. But true demonstration is ultimately possible if one breaks

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[189] Al-Fārābī (1985c, vol. 3, 81,15–82,4) translated into English by M. Rashed (2008, 27); cf. Mallet (in al-Fārābī 1999e, 32). In the passage immediately following this one (82,4 ff.), al-Fārābī criticizes Galen "the physician" (*al-ṭabīb*) for having failed to grasp the distinction between dialectic and demonstration and for having limited himself to the former in treating the question of the eternity of the world; see M. Rashed (2008, 27–28).

down the initial proposition into components that are then analyzed individually. Al-Fārābī's conclusion in this respect is explicit: "this is the method [*ṭarīq*] leading to the production of its demonstration [*burhān*]."

The explanation given in *Topica* concerning the proper mode to carry out a cosmological demonstration is echoed in *Taḥṣīl*, which shows the degree of al-Fārābī's preoccupation with this problem. In this work, al-Fārābī reiterates the point that mustering demonstrative proofs in order to reach certain knowledge is a difficult task that is replete with all kinds of pitfalls. Most of the time, when people think they are using demonstration, they are instead relying on other non-demonstrative methods, which is why they reach different and sometimes contradictory conclusions, or they apply demonstration only to part of what they seek, thinking that they are applying it to the entire thing sought, which again leads to a diversity of conclusions.[190] The main point to emerge from al-Fārābī's remarks is that aporias such as the question of the creation vs. eternity of the world are difficult to solve by relying on a single demonstration, since they contain various components and aspects that call for a variety of proofs and disciplines. Al-Fārābī does not elaborate on how the philosopher should carry out this systematic breakdown of the initial problem into its constituent parts and on what disciplines he should rely to study them. But keeping in mind what was said previously concerning his method, one may hypothesize that this approach should, in al-Fārābī's view, rely on the fundamental notion of the interrelatedness of the sciences. Accordingly, and with regard to the problem of eternity, physics and astronomy may contribute to its solution by examining the substance and motion of the superlunary bodies, and metaphysics by examining beings in general and the immaterial existents and their influence on the corporeal world in particular. All of these sciences would therefore study one aspect of the problem by focusing on the objects that fall within their field.

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[190] Al-Fārābī begins by stating that the goal of the theoretical sciences is "to make the beings and what they contain intelligible with certainty" (al-Fārābī 2001c, 13). It is clear that al-Fārābī is referring to demonstration here, which alone can lead to certain knowledge. But a few lines afterwards, he cautions that "the attainment of certain truth is aimed at in every problem. Yet frequently we do not attain certainty. *Instead we may attain certainty about part of what we seek, and belief and persuasion about the rest*" (my emphasis).

The accumulated evidence in *K. al-jadal* and *Taḥṣīl* does not in any way invalidate al-Fārābī's belief in the value of demonstration. Rather, these passages support Maimonides' testimony in an unequivocal way, even though they point to his awareness of the methodological difficulty of correctly implementing demonstration and of the reason why there are so many wide-ranging opinions on physical and metaphysical matters among the thinkers of his time.[191] While he endorsed demonstration, al-Fārābī was also fully aware of the discrepancy between theory and practice and of the necessity to adapt the inquiry and the philosophical method to the type of problem examined. This helps to explain why he proceeds carefully when addressing such complex questions as the eternity of the world in his own works and why he does not provide elaborate and extensive proofs to this effect.[192] In this respect, it is not surprising that the passages cited above provide only limited information on al-Fārābī's own position concerning the question of the eternity of the world. This aspect of his methodology has far reaching consequences that should be borne in mind when analyzing his cosmological doctrines.

At any rate, the views expressed in *K. al-jadal* and *Taḥṣīl* also find support in al-Fārābī's *Burhān*. Like its original Greek counterpart, *Posterior Analytics*, it is primarily devoted to the demonstrative syllogism (*qiyās burhānī*) and reveals the extent of al-Fārābī's interest in the theoretical framework behind demonstrative reasoning. More specifically, al-Fārābī develops the theory of the *burhān muṭlaq* (absolute or unconditional demonstration), which combines knowledge of the existent and knowledge of the cause, or put another way, consists in knowledge of the fact as well as the reasoned fact. In this passage, he makes it clear that this is the method that should be used in the theoretical sciences, such as physics and metaphysics.[193] Now since the substance of the heavens, the existence of the separate intellects, and

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[191] As Mallet (1996 passim) notes, it is likely that al-Fārābī has the *mutakallimūn* in mind when he discusses these aspects of dialectic in his *K. al-jadal*.

[192] This is true at least for al-Fārābī's extant works. For the arguments in his lost treatise *Fī l-mawjūdāt al-mutaghayyirah*, see M. Rashed (2008), whose interesting article nevertheless rests on a hypothetical reconstruction of its contents. For proofs for eternity in al-Fārābī, see also Davidson (1987) and Vallat ("Al-Farabi's arguments for the Eternity of the World," forthcoming). In any case, al-Fārābī's attitude toward this issue was nuanced and complex, and may also have evolved over time, as this study will argue.

[193] Al-Fārābī (1985c, vol. 4, 21 ff., 26 and 59 in particular).

the creation or eternity of the world are questions that belong to physics and metaphysics, al-Fārābī certainly believed, at least in theory, that these questions ought to be answered using the demonstrative method.

Further evidence supporting al-Fārābī's belief in the possibility of cosmological demonstration may be gleaned from his non-logical texts as well. In *Taḥṣīl*, the primacy of the theoretical sciences is asserted, as is its capacity to produce certain knowledge.[194] In *Jamʿ*, which, it should be noted, is a problematic work as far as its authenticity is concerned, al-Fārābī explains that Plato and Aristotle gave "clear and persuasive proofs" (*ḥujaj wāḍiḥah muqniʿah*) and "demonstrations" (*barāhīn*) to settle cosmological questions such as the creation of the world, although he does not elaborate on this statement.[195] Furthermore, in *Ārāʾ* he writes

> It follows necessarily from the specific being of the First that all the other existents which do not come into existence through man's will and choice are brought into existence by the First in their various kinds of existence, some of which can be observed by sense perception, whereas others become known by demonstration [*wa-baʿḍuhū maʿlūm bi-l-burhān*].[196]

Although al-Fārābī does not identify these "other existents," there is little doubt that they include both the celestial bodies and the immaterial beings below the First Cause, the separate intellects. This is confirmed in another passage of the same work, when al-Fārābī states that among the common first intelligibles (*al-maʿqūlāt al-uwal al-mushtarakah*)[197] that humans acquire are

> the principles [*mabādiʾ*] which are used for knowing the existents which are not the objects of man's actions, and their primary principles and ranks: such as the heavens [*al-samāwāt*] and the First Cause [*al-sabab al-awwal*] and the other primary principles and what happens to come to be out of those primary principles.[198]

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[194] Al-Fārābī (2001c, 13, 39 ff.).

[195] Al-Fārābī (2001a, 158). Naturally, one faces the problem in this case of explaining why al-Fārābī describes Aristotle as a creationist; on this question, see chapter 3.

[196] Al-Fārābī (1985a, 88–89 and 1985b, 55).

[197] According to al-Fārābī in *Al-fuṣūl al-khamsah* (1985c, vol. 1, 64,12–15), these common first intelligibles are one among four kinds of things that are not known through reflection and inference. The others include "things that are received, things that are well known, and sensibles [*maqbūlāt wa mashhūrāt wa maḥsūsāt*]."

[198] Al-Fārābī (1985a, 205 and 1985b, 103).

Al-Fārābī unambiguously states not only that human beings are predisposed for acquiring knowledge of the heavens, but that the "first intelligibles" that lead to such knowledge are commonly shared by all humans. Having listed the various things that "the people of the excellent city ought to know," which include knowledge of the First Cause, of the immaterial existents, and of the heavenly bodies, al-Fārābī goes on to explain that

> these things can be known in two ways: either by being impressed on their souls as they really are [*kamā hiya mawjūdah*] or by being impressed on them through affinity and symbolic representation. … The philosophers in the city are those who know these things through demonstrations [*bi-barāhīn*] and their own insight.[199]

The evidence from al-Fārābī's own hand coheres with modern reconstructions of his arguments. M. Rashed's recent study of *On Changing Beings* shows that this treatise originally contained an argument aimed at refuting Philoponus and at establishing the eternity of time and motion, and, hence, of the world. Approaching the question from a different angle, P. Vallat has convincingly shown that al-Fārābī intended various passages of his works to stand as implicit arguments for the world's eternity.[200]

On the basis of the cumulative evidence contained in al-Fārābī's logical and metaphysical treatises, one may conclude that the Second Teacher considered demonstration not only possible, but also the proper method to use in cosmological inquiry. Al-Fārābī's belief in the primacy and validity of demonstration is substantiated throughout his corpus in innumerable instances, and considerable effort is required to ignore them. Al-Fārābī makes it clear that demonstration is the highest philosophical method and that it is the only true means for humans to acquire the intelligibles "as they really are." The theoretical sciences that use demonstration are described as a model for the other kinds of arts and disciplines, even though the latter can only provide symbolic imitations or approximations of their results. In light of this, it is not surprising that al-Fārābī equates *burhān* with *falsafah* in his introductory

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[199] Al-Fārābī (1985a, 277–279, translation slightly revised, and 1985b, 146–147).

[200] See M. Rashed (2008). Rashed concludes that al-Fārābī relied on both analytical and synthetic arguments to achieve this aim. Vallat ("Al-Farabi's arguments for the Eternity of the World," forthcoming) shows that al-Fārābī used Proclean material to articulate some of his proofs of eternity.

work *Naṣṣ al-tawṭiʾah*.[201] As G. Endress writes, "al-Fārābī added to earlier concepts of philosophy in Islam the radically Aristotelian concept of philosophy as a demonstrative science which proves universally what in the particular sciences is deduced by particular 'indications' or 'signs.'"[202] Al-Fārābī accepted Aristotle's concept of demonstrative proof and considered it philosophy's task to provide certain knowledge of, among other things, cosmological questions like the eternity of the world.[203]

In spite of the foregoing, however, al-Fārābī's views on demonstration and certain knowledge are sometimes difficult to reconcile with the method and style of his treatises. Indeed, al-Fārābī does not systematically implement his theory of demonstration in his extant cosmological and metaphysical works. Although he adopted Aristotle's syllogistics and theory of demonstration and accepted their applicability to cosmology, the question remains as to why his writings, and *Ārāʾ* and *Siyāsah* in particular, are devoid of extensive demonstrative proofs. For example, al-Fārābī, unlike Ibn Sīnā, does not demonstrate

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[201] Al-Fārābī (1985c, vol. 1, 56,8).

[202] Endress (2003, 138).

[203] In view of the substantial evidence pointing to this conclusion, it is difficult to understand the thesis defended by some scholars, who argue that al-Fārābī rejected the demonstrative method and adopted dialectic or even rhetoric as his principal means of philosophical argumentation. This view was intimated by Mallet (1996 and his introduction in al-Fārābī 1999e) and developed more systematically by Galston (1990), who defines al-Fārābī's metaphysics as a veiled form of dialectic. But more radical interpretations have also been advanced, in which al-Fārābī's alleged lack of interest in the demonstrative method is combined with the claim that he substituted political science for metaphysics. This position, which is grounded in the works of L. Strauss and M. Mahdi, has been articulated notably by Colmo (2005) and Parens (2006). Parens argues that al-Fārābī was fully aware of the limits of metaphysics and thus promoted politics as the key science. He writes: "These limitations of the theoretical sciences no doubt contributed to Alfarabi's conviction that political science or political philosophy may offer a superior frame for philosophy as a whole than metaphysics" (Parens 2006, 116). As for Colmo, he argues that al-Fārābī's philosophical language is not essentially different from the rhetorical and metaphorical language he attributes to religion. Accordingly, al-Fārābī's philosophy should itself be construed as a kind of religious imagery. Central to this approach is the correlation made between al-Fārābī's alleged belief in the limits of metaphysical knowledge and the impossibility of a demonstrative method and the subsequent establishment of the political science as the most important discipline in his philosophy. In his recent book on al-Fārābī, Vallat (2004, especially 85–129) has compellingly criticized some of these views and argued that al-Fārābī's political theories reflect a complex ontological and epistemological system that finds its roots in the Neoplatonic tradition. He concludes that it is metaphysics, not politics, which forms the foundation of al-Fārābī's philosophy, even though al-Fārābī did develop an elaborate political theory on this metaphysical foundation.

the existence of the separate intellects, nor does he try to justify their number and explain why there cannot be an infinite series of intellects.[204] And unlike al-Kindī, al-Fārābī does not provide any argument concerning the ensoulment and rationality of the celestial orbs as well as the question of whether they possess the senses of vision and hearing. More disturbingly, the Second Teacher does not articulate an explicit and elaborate proof for the eternity of the world in his later metaphysical treatises. This discrepancy between theory and practice must be accounted for.

One way of explaining it is to focus on the genre and purpose of these works. *Ārāʾ* and *Siyāsah* possess a condensed, adumbrated format that point to their potential didactic function. Whether these treatises are the embodiment of years of oral teaching and transmission, as Vallat suggests,[205] or were designed to convey in summary form the gist of al-Fārābī's mature philosophy, it is clear that their style and structure are not adapted to contain long, protracted arguments. Far from being a unique phenomenon in the history of Arabic philosophy and science, this type of treatise belongs to a wider literary genre characterized by this particular mode of exposition and which privileges a descriptive style over a demonstrative one. For example, the *hayʾah basīṭah* genre that developed in Arabic astronomy deliberately shunned demonstration.[206] In the philosophical tradition, short treatises such as Ibn Sīnā's *Dānesh-nāmeh* and *Mabdaʾ*, as well as the Avicennan *ʿUyūn al-ḥikmah* fulfill a similar function and contrast with his exhaustive treatment of philosophical topics in *Shifāʾ*. This does not mean that these works are unscientific, but merely that their primary aim was to convey in a clear and condensed form doctrines that had been proved and discussed at length in other works. If al-Fārābī's *Ārāʾ* and *Siyāsah* were designed to give this kind of philosophical overview or if they are the product of oral transmission, then it is understandable that they would shun elaborate demonstrations. Seen from this perspective, it would seem that, far from being exceptions, these works belong to a well-established scientific and philosophical tradition in medieval

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[204] One exception is to be found in *Ithbāt* (al-Fārābī 1999d, 4 ff.), which provides several proofs for the existence of the separate intellects, although it says nothing about their number. The authenticity of this work, however, remains to be established.

[205] Vallat (2004, 12).

[206] As Ragep (1993, 36) writes: "Since a *hayʾa basīṭah* work was an account meant to give a general overview of astronomy, it was generally held that it should be devoid of mathematical proof."

Arabic literature.[207] One may reasonably surmise that al-Fārābī provided longer demonstrations in some of his other and no longer extant works, such as his commentary on *Physics* and perhaps his treatise entitled *K. fī l-ʿilm al-ilāhī*.[208]

Al-Fārābī's reluctance to engage in protracted demonstrative arguments may nevertheless have deeper philosophical roots. As was stressed earlier, he was aware of the practical limitations and difficulty of demonstration, especially when it came to addressing general cosmological problems. But his genuine interest in Aristotelian syllogistics may also have been counter-balanced by a penchant for the aporetic doctrine of the Neoplatonists and the notion of divine transcendence. It is in this connection that I wish to discuss an important epistemological concept, namely, analogy, which plays a crucial didactic and cognitive role in al-Fārābī's cosmology and in his philosophy as a whole.

3.2. *The Limits of Human Knowledge and the Role of Analogy*

The analysis has up to this point underscored al-Fārābī's belief in the knowability of heavenly phenomena and in the possibility of adducing demonstrative arguments to prove their existence. Besides this positive evidence, however, a different picture emerges from other passages of al-Fārābī's works, suggesting that only a limited knowledge of the metaphysical beings is possible. From a cosmological standpoint, this is problematic, insofar as these immaterial principles govern the celestial bodies, with the implication that they must first be defined in order for one to fully grasp the nature of the heavens. Although this kind of evidence does not contradict al-Fārābī's belief in demonstration, it raises the question of whether the human inquiry into the cosmos is after all limited.

In various passages of his works, al-Fārābī displays a marked skepticism towards the possibility of acquiring direct knowledge of superlunary beings, especially of God. One gets the impression that he

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[207] This conclusion, it should be noted, is not incompatible with Rudolph's (2008) convincing argument that the structure of *Ārāʾ* was partly modeled on contemporary theological treatises.

[208] The latter work is mentioned by Ibn al-Qifṭī (1903, 280). Some of al-Fārābī's extant metaphysical works are not devoid of a certain interest for demonstration. For example, in *Ārāʾ* (al-Fārābī 1982a, 37–46) he demonstrates in some depth that the First must necessarily be a unique being with no associates, that It cannot have a contrary, that It is not divisible, etc. His argumentation in these passages is not devoid of a certain deductive quality.

denies humans full access to the divine world. For example, in *Jamʿ*, he writes:

> Thus we say: since the Creator, may His Majesty be dignified, differs in substance and essence from anything else in that He is of a more venerable, more excellent, and higher species, nothing is analogous to, resembles, or is similar to His substance either in truth or metaphorically. Yet, despite this, we cannot avoid describing Him and applying to Him some of these synonymous utterances [*alfāẓ min hādhihī l-mutawāṭiʾah*]. It is therefore necessarily requisite for us to know that with each utterance we state as one of His attributes, He remains in essence remote from the idea we conceptualize from that utterance.[209]

And later on he adds:

> One should know that necessity dictates applying synonymous utterances from physics and logic to those subtle and venerable ideas that are exalted above all descriptions and divergent from all the things that come into being and exist naturally. … Since necessity stands as an obstacle and intervenes between us and that, we limit ourselves to existing utterances, forcing ourselves to bear in mind that the divine meanings [*al-maʿānī l-ilāhiyyah*] we express by means of these utterances are of a more venerable species and are other than we imagine and conceptualize.[210]

A similar point of view is expressed in the emanationist treatises:

> It is difficult and hard for us to apprehend It [the First Cause] and to represent It to ourselves, because of the weakness of our intellectual faculties, mixed as they are with matter and non-being [*al-māddah wa-l-ʿadam*]: we are too weak to think It as It really is.[211]

And:

> The pleasure which the First enjoys is a pleasure whose character we do not understand and whose intensity we fail to apprehend, except by analogy [*bi-l-qiyās*] and by relating it to the amount of pleasure which we feel.[212]

In a similar vein al-Fārābī explains in *Mūsīqā*:

> And the method that the theorist who cannot discern these harmonic beings [i.e., some musical notes] will use to represent them is the method

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[209] Al-Fārābī (1999e, sec. 67, 145 and 2001a, 161, translation revised).
[210] Al-Fārābī (1999e, sec. 70, 149 and 2001a, 162–163).
[211] Al-Fārābī (1985a, 78–79 and 1985b, 50).
[212] Al-Fārābī (1985a, 84–85 and 1985b, 53). For equivalent statements in *Siyāsah*, see al-Fārābī (1964, 46–47, 49–50).

> through which he conceives things that cannot be perceived by the senses, such as the soul, the intellect, prime matter, and all of the separate existents. Indeed, those things cannot be used or studied that cannot be imagined at all; since their imagining is not possible through the senses, another method was devised in order to imagine them, and this is what is called the method of comparison [*muqāyasah*] and the method of analogy [*munāsabah*].[213]

Two important points are reflected in these passages. First, they show al-Fārābī's awareness of the limits of metaphysical knowledge, or at least his awareness of the difficulty humans experience in acquiring this type of knowledge. The passage from *Mūsīqā* in particular highlights the fact that the direct apprehension of the immaterial existents—including the separate intellects and the First Cause—is not possible and requires the mediation of analogical techniques. This skeptical feature of al-Fārābī's epistemology has already been noted by some scholars, who have compared it to the *via negativa* of Christian theology or the aporetic ontology of Neoplatonism.[214] Second, these excerpts describe analogical reasoning as a privileged method for acquiring insight into the intelligible world. In *Mūsīqā*, again, al-Fārābī advises the aspiring musical theorist to rely, like the metaphysician, on comparison and analogy in order to acquire some knowledge of the intelligible things that lie beyond the realm of sense perception. Analogy is described as a bridge linking the physical and metaphysical worlds and

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[213] Al-Fārābī (1960a, 105).

[214] This skeptical streak in al-Fārābī's philosophy has been recognized for some time. Already in 1979, Pines published an article on al-Fārābī's psychology and metaphysics in which he argued that Maimonides' skepticism toward the possibility of metaphysical knowledge stemmed partly from his reading of some of al-Fārābī's writings, especially his commentary on *Nicomachean Ethics*. According to Pines, in this work, which incidentally has not survived, the Second Teacher denied the immortality of the human soul and its capacity to apprehend metaphysical beings. Pines' method and conclusions have been criticized by Vallat (2004, 102 ff.). See also Booth (1983), who devotes a chapter of his book to al-Fārābī, as well as the more recent comments by Reisman (2005, 58). This feature of al-Fārābī's thought may find its origin in the far-reaching influence of the *Neoplatonica arabica* in the early centuries of Islam, which promoted the Neoplatonic doctrine of the transcendence and ineffability of the One. There are striking resemblances between al-Fārābī's statements and passages from *Theology of Aristotle* (see Adamson 2002, 112 ff., especially 115), which also bring to mind Proposition 5 of *Maḥḍ al-khayr* (Badawī 1977a, 8) and Proposition 1 of *Liber de causis II* (Thillet and Oudaimah 2001–2002, 318). Al-Fārābī seems to share with some earlier Neoplatonists the belief that some intelligible entities are inaccessible to the human mind (at least through discursive thought), and he also shares a penchant for analogical language when it comes to describing these immaterial beings; see Vallat (2004, 275 ff.).

as the only means available to humans to catch a glimpse of the realm of the intelligible.

One question worth asking is whether al-Fārābī's skepticism about the knowability of the intelligible beings extends to the celestial bodies as well. Maimonides' statement in *Guide* (2.25.54b) seems to deny humans substantial, if not partial, astronomical and cosmological knowledge.[215] Al-Fārābī does not openly admit that such knowledge is impossible, but the previously quoted excerpts could point to such a view. Yet there are several reasons to believe that this was not the case. The aforementioned passages mention immaterial beings, especially the First, but the celestial bodies are corporeal and as such can be perceived and studied by the senses, as al-Fārābī explains in *Taḥṣīl*.[216] In addition, al-Fārābī highly values the empirical and observational approach in astronomy, a fact that did not escape Ibn Rushd, who stresses the importance al-Fārābī placed on sense perception in his cosmological method.[217] In *Burhān* al-Fārābī explains that the particular sciences such as astronomy and physics can benefit the metaphysical inquiry by providing some kind of knowledge of the heavens and even of the immaterial beings that govern them, since the number of unmoved movers partly depends on the study of celestial motions. Finally, in *Falsafat Arisṭūṭālīs*, the transition between the study of motion and the hypothesis of a first unmoved mover responsible for the beginning of motion is brought out in his discussion of *Physics*.[218] True, al-Fārābī is here describing Aristotle's methodology, but M. Rashed has shown that he adopted a similar analytical approach to prove the eternity of the world in his lost work *Al-mawjūdāt al-mutaghayyirah*.[219]

These points show clearly that al-Fārābī considered knowledge of celestial phenomena and of the orbs and planets possible, although his attitude toward the metaphysical beings and especially the First remains ambiguous. But more attention should be given to al-Fārābī's comments on analogy, which he praises as a philosophical tool in various passages of his works. How is analogy to be employed and how does it

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[215] The interpretations of Langermann (1991) and Rudavsky (2000, 24–30) should be taken into account when assessing Maimonides' cosmological method.
[216] Al-Fārābī (2001c, sec. 14, 20).
[217] See M. Rashed (2008, 23–25).
[218] Al-Fārābī (2001c, 102–103).
[219] M. Rashed (2008).

fit in his epistemological scheme? More specifically, what is the cosmological relevance of analogy? In spite of the fact that texts such as *Mūsīqā* clearly stress the value of analogical reasoning, they offer virtually no indication as to how this method should be utilized. In order to shed light on this problem, it is necessary to examine in more detail al-Fārābī's conception of analogical techniques and particularly the method of transference.

3.3. *Transferred Terms (asmāʾ manqūlah) and Transference (naqlah)*

During the ninth and tenth centuries, Arabic philosophical terminology was slowly crystallizing as a result of the translation movement from Greek to Arabic and the intense intellectual activity that developed in urban centers such as Baghdad. Al-Fārābī appeared on the scene during this period, and his contribution to the formation of a distinctive Arabic philosophical vocabulary was significant, as modern studies have shown.[220] Al-Fārābī also developed a quite nuanced theory of the evolution of language, which can be found in his works on logic and *Ḥurūf*. More specifically, al-Fārābī's conception of how specialized philosophical terminology is shaped has a direct bearing on the study of his cosmology and may help to explain some points of method proper to the emanationist works.

On the one hand, al-Fārābī believes that the specialized terminologies of the sciences are elaborated gradually over a protracted period of time. He is aware that some terms are transmitted from one culture to another and subsequently undergo a process of assimilation in their new cultural environment. As a philosopher, al-Fārābī derived much of his technical vocabulary from the Arabic translations of the Greek works he read. For his cosmology and natural philosophy, for example, he had access to a set of technical terms transliterated or translated from works such as *On the Heavens*, *On Generation and Corruption*, *Meteorology*, and *Physics*. To give a few examples, the Arabic *ṣūrah* corresponds to the Greek μορφή, *hayūlā* and *māddah* to ὕλη, *mawḍūʿ* to ὑποκείμενον, and *ṭabīʿah* to φύσις. Likewise, *falak* renders the Greek σφαίρα or κύκλος, while *kawkab* is, like the Greek ἀστήρ, a generic term that can refer to the stars, the planets, and the sun.[221] Hence, the basic

[220] Zimmermann (in al-Fārābī 1981a), Abed (1991), Langhade (1994), Lameer (1994), Alon (2002), Kennedy-Day (2003), Black (2006), and Menn (2008).

[221] Hartner *EI*², and Kunitsch and Knappert *EI*².

conceptual and terminological framework that al-Fārābī utilizes in his description of the cosmos is indebted to the ancient and late antique philosophical and astronomical traditions. These examples illustrate the terminological and conceptual continuity between ancient Greek and early Arabic cosmology and natural philosophy.

On the other hand, al-Fārābī is aware that many other terms enter the philosophical discipline as a result of developments within a given culture. It is often the case that terms used in a popular context acquire a specialized meaning over time. *Jawhar*, for example, which for the masses designates a precious stone, acquired the technical meaning of 'substance' as a result of the development of philosophy.[222] *Jawhar* is an example of what al-Fārābī calls a "transferred term" (*al-ism al-manqūl*). Al-Fārābī describes this linguistic phenomenon in detail in some of his logical works, as in *K. al-ʿibārah* or his commentary on Aristotle's *On Interpretation* and in the appending treatise on the same subject entitled *Short Treatise on Aristotle's De interpretatione*.[223] In the latter work, al-Fārābī defines "transferred terms" (*al-asmāʾ l-manqūlah*) as follows:

> A term is transferred if a word generally known to have been the signifier of a certain thing ever since it was first introduced is later taken and used to signify a certain other thing, but remains the common name of the first and the second. This situation arises when discoveries are made by developing disciplines. … The discoverer then transfers to them the names of similar things generally known; for every new thing he introduces the name of the known thing he thinks is most closely akin to it.[224]

Shortly thereafter (sec. 53), al-Fārābī again mentions *jawhar* as an example to explain the relation between transference and homonymy: "Transferred terms are often used homonymously in the fields to which

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[222] Al-Fārābī (1970, sec. 68–69, 101–102).

[223] The latter treatise was translated and published by Zimmermann after al-Fārābī's commentary (in al-Fārābī 1981a, 220 ff.). A recently published article by Vaulx d'Arcy (2010) provides a detailed analysis of the concept of transfer (and transferred terms) in al-Fārābī's philosophy. Although the author claims that "cet article entend présenter pour la première fois un concept central d'al-Fārābī," insight into this concept has already been given by Rescher (in al-Fārābī 1963), Lameer (1994, 13–20), Gyekye (1972 and 1989), and especially by Janos (in his doctoral dissertation "Intellect, Substance, and Motion in al-Fārābī's Cosmology," McGill University, 2009, 94–107), who discusses many ideas and passages also found in Vaulx d'Arcy's article. It is surprising that the latter does not acknowledge any of these previous contributions.

[224] Al-Fārābī (1981a, sec. 48, 227–228). Transferred terms are also briefly discussed in *Introductory Sections on Logic* (al-Fārābī 1955, 274–275).

they have been transferred, like the term *jawhar*, which is transferred to the theoretical sciences and used homonymously there." This quotation is important insofar as it shows that for al-Fārābī at least some transferred terms possess an intrinsic homonymous quality.[225]

A passage in *Iḥṣāʾ* provides a relevant case study of how certain terms come to be transferred and enter the methodology of the philosophers:

> Indeed, shape, form, and design [*al-ṣīghah wa-l-ṣūrah wa-l-khalqah*] are almost synonymous [*mutarādifah*] terms that the masses [*jumhūr*] use to indicate the shapes of animals and artificial bodies. But by way of similarity [or analogy] [*ʿalā ṭarīq al-tashbīh*], they were transferred [*nuqilat*] and were made into nouns that refer to the faculties [*al-quwā*] and things whose status in the natural bodies is that of shapes, forms, and designs in artificial bodies.

And al-Fārābī adds, "this is because it is customary in the arts [or sciences, *ṣanāʾiʿ*] to transfer by means of similarity to the objects they contain [i.e., study] the names which have been established by the masses."[226] Here we notice that al-Fārābī establishes a connection between the process of transference and the concept of similarity (*tashbīh*). Hence, although the two previous passages indicate that some transferred terms are homonymous, they may also point to similar characteristics in the various subjects they qualify. One may argue that it is precisely this similarity between the two things compared that enables transference to occur, in which case transference could be seen as a kind of analogical reasoning.

From the foregoing comments, we may infer that al-Fārābī would have considered the technical terms he uses in his physics and cosmology to fall in the category of transferred terms. After all, *jism*, *ṣūrah*,

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[225] Al-Fārābī does distinguish, however, between the homonymy of transferred terms and other types of homonyms by introducing a chronological distinction. In this regard, he writes (1981a, sec. 49, 228–229): "The difference between transferred and homonymous terms is that the homonymy of the homonym has been with it from the moment it was first introduced, so that none of its two significations preceded the other in time, while with the transferred term one of the two significations preceded the other in time." On homonymous terms in al-Fārābī's philosophy, see Menn (2008), who provides an in-depth study of al-Fārābī's discussion of particles and philosophical terms in *Ḥurūf* and its relation to *Metaphysics* Book Delta. Menn's study is useful to understand the development of al-Fārābī's metaphysical vocabulary, although it does not explain how the conception of being as expressed in *Ḥurūf* relates to al-Fārābī's emanationist treatises.

[226] Al-Fārābī (1949, 95, my translation).

mawḍūʿ, and *nafs*, to give only a few examples, have a popular meaning that harks back to the invention of language, and it is only at a specific point in time that they acquired a technical and more specific philosophical meaning. These terms had prior significations before they were applied to cosmology or physics: *ṣūrah* may refer to the shape or contour of a thing, while *mawḍūʿ* is a grammatical term meaning 'subject.' It is only as a result of a gradual process that they were transferred from a popular usage to a more specialized semantic sphere. That these transferred terms end up constituting the nomenclature of philosophers is confirmed when al-Fārābī writes that "transferred terms are used in sciences and other disciplines for things whose knowledge is peculiar to specialists."[227]

Although transferred terms are in themselves important to understand al-Fārābī's perception of the evolution of philosophy, they go hand in hand with an important analogical method called *naqlah*, which al-Fārābī appears to be using in his works. Indeed, the praise of analogy that one finds in *Mūsīqā* is implemented in *Ārāʾ* and *Siyāsah*, as well as in other works such as *Fī l-ʿaql*. In these works, al-Fārābī relies consistently on similarity and analogy to describe metaphysical, cosmological, and psychological beings or concepts.[228] In *Ārāʾ*, for instance, al-Fārābī explains that terms such as "living" (*ḥayy*) and "wise" (*ḥakīm*) can only be predicated of God by analogy with things in this world.

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[227] Al-Fārābī (1981a, 231). Furthermore, al-Fārābī distinguishes in this passage transferred terms from metaphors, which, unlike the former, are "not used in any science." Ibn Sīnā in *Metaphysics* of *Shifāʾ* (2005, 125) refers several times to terms that are "transferred" (*nuqila*) in a manner that recalls al-Fārābī's comments, but it is not possible on the basis of this passage to conclude that he shared al-Fārābī's historical theory of transferred terms.

[228] It is difficult to distinguish the two concepts of analogy and similarity in al-Fārābī's philosophy, and it is unclear to me to what extent they overlap. The ambiguity surrounding analogy and similarity partly stems from al-Fārābī's own terminology and his failure to provide clear definitions. As Alon's *Lexicon* shows, al-Fārābī uses a whole array of terms to express these concepts, some of which have a common root. *Qiyās*, *tamthīl*, *tanāsub*, *munāsabah*, may all mean "analogy," while "similarity" is expressed by *shibh* or *tashābuh*. Another hint at their connection appears in al-Fārābī's definition of analogy in one version of *Ḥurūf*: "Analogy, *which is a similarity in ratios*, consists of the excesses, deficiencies, and equalities that possess a similarity, be they of different genera" (*wa-l-tanāsub, huwa tashābuh al-nisab, an takūna l-ziyādāt aw al-naqṣānāt aw al-musāwāt allatī lahā mutashābihah wa-in kānat fī ajnās mukhtalifah*). Although this definition refers primarily to Euclidean geometry, it is also relevant to the wider context of al-Fārābī's philosophy and it stresses the close connection between similarity and analogy. I owe this citation to Vallat (2004, 276–277), who took it from an unpublished edition of *Ḥurūf*. Vallat (2004, 275–278) reaches the same conclusion on the relation between similarity and analogy.

God, indeed, is living and wise, but not in the same way that sublunary existents are, since God is immortal and eternal and has the "most perfect existence," while the latter are mortal and perishable.[229] By analogy with things already known to humans, one can get insight into God's essence, although it will necessarily be a limited form of knowledge. This type of analogy relies on the notion of common or homonymous names (*al-asmāʾ l-mushtarakah*), which express the perfections that pertain to God in an absolute sense, and which common objects have in a relative and derived sense.[230]

In these same works, al-Fārābī further explains that this analogical method is made possible by transferring terms from one realm to another, that is, from the human realm of sense perception to the intelligible realm of the divine. More specifically, the common names used in everyday speech to describe things can be transferred (*nuqila*) to other metaphysical beings and even to the First Cause itself. "When names like these are transferred [*nuqilat*] and applied to the First," al-Fārābī writes, "we have in mind to denote by them the relation the First has to other things by virtue of the existence which has been emanating from it."[231] And in *Siyāsah*, he writes that

> these terms are applied to the First in the most prior and true manner and to anything else only by posteriority, but it is not unacceptable if our application of these terms to the First came after our application of them to something else—for clearly our application of many of them to the First is only by way of transferring them [*ʿalā jihat al-naql*] from something else to It and after we had applied them to something else for a time.[232]

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[229] Al-Fārābī (1985a, 75–77 and 1985b, 48–49); cf. *Siyāsah* (al-Fārābī 1964, 46–47, 49–50).

[230] See al-Fārābī (1964, 50–51, 1985a, 73–77, and 1985b, 46–49), Vallat (2004, 275 ff.), and Menn (2008). Whereas Vallat's account emphasizes the Neoplatonic background of al-Fārābī's theories and connects him to thinkers such as Proclus, Menn proposes to construe al-Fārābī's theories on philosophical terminology and his doctrine of being as an original interpretation of Aristotle's *Metaphysics*, particularly Book Delta, thus highlighting the importance of this text in the development of al-Fārābī's philosophy in general. Many of the concepts I discuss in the context of al-Fārābī's cosmology, such as transference, homonymy, and analogy, are alluded to or described by Aristotle in this part of *Metaphysics*. For instance, in Delta 16, Aristotle mentions terms such as "perfect" and "good," which can be "transferred" (μεταφέροντες and κατὰ μεταφορὰν) from one context to another. Al-Fārābī conceives of transference differently, but it is tempting to view Book Delta, in addition to Aristotle's logical treatises, as a possible model for some aspects of his analogical method.

[231] Al-Fārābī (1985a, 100–101 and 1985b, 60).

[232] Al-Fārābī (1964, 51).

The terms "transferred" to the metaphysical realm thus have a prior usage and meaning in the world of sense perception. Chronologically speaking, they are applied first to sublunary bodies and only then and by extension to the immaterial beings. This view coheres with al-Fārābī's understanding of the development of philosophical language as previously discussed. Moreover, we can see from these quotations that the homonymous and transferred terms that al-Fārābī defines in his works on logic, such as *K. al-ʿibārah*, are actually implemented and used in *Ārāʾ* and *Siyāsah* in his philosophical discussions about the First and the other metaphysical beings. This points to the close connection between al-Fārābī's logical treatises and his cosmological works.

Given the importance these transferred terms play in al-Fārābī's descriptions of the First Cause, it is not surprising that he uses the same technique to describe the celestial bodies. In *Ārāʾ* and *Siyāsah*, he compares the forms and substrates of the celestial bodies to those of sublunary bodies. The heavenly substrates "resemble" (*tushbihu*) the sublunary material substrates, while the souls of the heavenly bodies "resemble" (*tushbihu*) or are "like" (*ka*) the sublunary forms.[233] Al-Fārābī uses analogical language to compare the celestial bodies to the hylomorphic bodies of the sublunary world without establishing an identity between the two. Hence, terms belonging to sublunary physics are "transferred" to the heavens. This practice is described in *K. al-qiyās*, which contains an entire section on the epistemological status of inference and more precisely on a technique al-Fārābī calls *naqlah*, transference.[234] According to him, this technique is also what the theologians call "inference from the evident to the absent."[235] In the passage under

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[233] Al-Fārābī (1964, 41, 1985a, 120–121, and 1985b, 69–71). In these passages, al-Fārābī deploys an analogical language or language of similarity, which is based especially on the *sh-b-h* root, and which stresses the parallels between superlunary and sublunary bodies without establishing an identity between the two. It is worth reiterating that terms from the *sh-b-h* root also appear in al-Fārābī's discussion of the technique of transference in his logical works. This common terminology suggests a close connection between transference, similarity, and analogy; see Vallat (2004, 226ff., 307ff.).

[234] Rescher translates it as "inference by transfer" or simply "analogy," and Gyekye as "analogical inference." See al-Fārābī (1963, especially 266,13–268,20), Lameer (1994, 13–20), Gyekye (1972, 33), and Rescher (in al-Fārābī 1963, 93). The present discussion of transfer will be restricted to its relevance for al-Fārābī's cosmology. For a broader treatment of this concept, see Vaulx d'Arcy (2010).

[235] Al-Fārābī (1963, 266,15 and 1985c, vol. 2, 45): *wa-huwa alladhī yusammīhi ahl zamāninā l-isdidlāl bi-l-shāhid ʿalā l-ghāʾib*. The theological background of al-Fārābī's account of *istidlāl* has been studied by Lameer (1994, 204ff.). For a more general

discussion, al-Fārābī provides an analysis of this type of inference, of its aim, of the conditions necessary for its conclusions to be valid, and he also explains how it may be put into syllogistic form. As he himself puts it, the aim of this section of the treatise is to "discuss the 'transfer' from a judgment by [immediate] sensation in some matter [*amr*], or [direct] knowledge about it by some other approach, to another matter outside the realm of [immediate] sensation."[236] In essence, *naqlah* consists in ascribing a certain quality to a thing that is not known to us on the basis of other things that are known to us to possess this quality. Naturally, the two objects compared must present a valid commonality for transference to be effective. More specifically, this is how al-Fārābī defines the technique of transference:

> The manner of this "transfer" is: that it is known by sensation that a certain "matter" [*amr*] is in a certain condition, and that a certain "thing" is present in a certain "matter"; and so the intellect consequently transfers this condition or thing from this [known] matter to some other [unknown] matter similar to it, and thus judges with respect to it [i.e., the other, unknown, "matter"] upon this [known] basis.[237]

Al-Fārābī then goes on to explain that there are two modes of transference, analysis (*taḥlīl*) and synthesis (*tarkīb*). If correctly conducted, these can be put into first figure syllogisms. Analysis begins with the thing that is sought, whereas synthesis begins with what is already known. In other words, analysis entails moving backward from the conclusion to the premises, whereas synthesis proceeds from the premises to the conclusion.[238]

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discussion of this technique in *kalām*, see Alami (2001, 121 ff.). In contrast, Rescher (al-Fārābī 1963) and Gyekye (1972 and 1989) emphasize the link between *naqlah* and ancient Greek logic. The former proposes to trace analysis and synthesis to Aristotle's *Prior Analytics*, the latter to the works of Sextus Empiricus and Pappus of Alexandria. Lameer restricts his analysis of *naqlah* mostly to *kalām*, but he agrees with Gyekye in regarding the work of Pappus as a possible precedent (216).

[236] Al-Fārābī (1963, 266,13–14).

[237] Al-Fārābī (1963, 266,16–18).

[238] Al-Fārābī (1963, 267,20 ff. and 1985c, vol. 2, 46 ff.), Lameer (1994, 215–216). According to Lameer, the practical difference between these two modes of inference in logic is somewhat "superficial," since both rely on the data provided by induction and are analytical in essence. But analysis and synthesis also appear in al-Fārābī's mathematical treatises. As Freudenthal explains, al-Fārābī stresses two different, yet complementary, ways of approaching the problem of the relation between abstract geometrical entities (points, lines, etc.) and physical bodies. One consists of analysis, i.e., proceeding from the consequences to the first principles, and the other of synthesis, the opposite method, which involves moving from the first principles to the consequences and putting the elements in "the order in which they exist" (Freudenthal 1988,

The relation between transferred terms and the technique of transference should appear clearly at this point. Al-Fārābī's discussion of *naqlah* in *K. al-qiyās* represents the logical formulation of and the pendant to the linguistic treatment of transferred terms (*asmāʾ manqūlah*) that appears for instance in *K. al-ʿibārah* and that is implemented in *Ārāʾ* and *Siyāsah*. According to al-Fārābī, there is a natural progression from the phenomenon of transferred terms to the analogical technique of transference (*naqlah*). Conversely, one may view the appearance of transferred terms as the result of the practice of transference.

One could object at this point that the technique of *naqlah*, at least as it is described in *K. al-qiyās,* is to be attributed to the theologians and is not endorsed by al-Fārābī himself. But this view is nevertheless unlikely. Al-Fārābī merely remarks that the *mutakallimūn* call this technique by another name (*al-isdidlāl bi-l-shāhid ʿalā l-ghāʾib*) from the one he himself uses (*naqlah*), and he does not in any way confine its use to the theological camp. Al-Fārābī's comments in the introduction and conclusion of this treatise reveal that he viewed its contents as genuinely Aristotelian, although he explicitly says that its *examples* were chosen for a contemporary audience.

110, 124 ff.; and 1990, 55; al-Fārābī 1960a, 185–188, 211). Al-Fārābī's comments on analysis and synthesis should be construed in light of his digressions on the scientific method in some of his philosophical treatises, especially *Taḥṣīl*. In the latter work, al-Fārābī broadly follows Aristotle's *Physics* 1.1 in describing the physical method as being essentially analytical, and he contrasts it with the synthetic, deductive method of mathematics, which proceeds from basic abstract principles to composite objects and finally bodies; see al-Fārābī (2001c, 18–22); cf. Adamson (2007a, 18), who briefly discusses synthesis and analysis in al-Kindī's works. As it turns out, the methods of analysis and synthesis in mathematics and physics bear an ambiguous relation to those discussed by al-Fārābī in *K. al-qiyās*; see Freudenthal (1988, 129–133). Perhaps the most obvious difference is that analysis in geometry consists of a process of gradual abstraction and is thus not an analogical mode of reasoning in the way that analysis in transference is. Freudenthal, who is to my knowledge the only scholar to have addressed the relation between these concepts in al-Fārābī's corpus, rightly suggests in my view that analysis and synthesis in a geometrical and in a logical context stem from different traditions. The concepts discussed by Freudenthal are definitely the ones that appear in al-Fārābī's *Mūsīqā* (al-Fārābī 1960a, 185–188, 211), and they are also similar to the ones analyzed in M. Rashed (2008, 37–39, 42–43, 54). In contrast to geometry, music, physics, and metaphysics, the concepts of analysis and synthesis in al-Fārābī's logical works, and in his discussion of *naqlah* in particular, seem to have their own characteristics. In any case, this issue is intricate and requires further research. I refer the reader to Beaney's (2007) article and bibliography, which discusses the different functions of these concepts in the ancient, medieval, and modern periods; see also Hintikka and Remes (1974). With regard to Arabic philosophy, analysis and synthesis have been studied mostly in a mathematical context; see Rashed (1991) and Bellosta (1991), who focus on the works of Ibn al-Haytham and Ibn Sinān respectively.

Of particular relevance in this respect is the fact that al-Fārābī provides a cosmological example to illustrate the use of *naqlah*. He writes:

> This [transference] occurs [for example] when one knows by sensation that some corporeal substances, like the animals and similar things, are created, and consequently the intellect transfers the createdness from the animals or plants, and thus judges about the sky and stars that they are [also] created.[239]

What is important for the present purpose is not the conclusion reached concerning the createdness of the celestial bodies, since al-Fārābī informs the reader at the beginning of the treatise that his examples are chosen on the basis of their intelligibility and familiarity to a contemporary audience. For this reason it would appear that it is not possible to ascribe to al-Fārābī the philosophical positions that are reflected in the conclusions of these examples.[240] Rather, what is significant is the fact that al-Fārābī chose a cosmological example to illustrate the use of transference, which implies the applicability of *naqlah* to cosmology. And so it is not surprising to find that al-Fārābī often compares the celestial and sublunary bodies in his cosmological works, with the assumption that these beings possess similar principles simply by virtue of being bodies.[241] Some of these principles, such as form, matter, and soul, as well as the proposition of the perishability of bodies given in the example above, can be identified from experience and through the physical investigation of sublunary bodies, and then "transferred" to other remote substances, such as the stars and planets. Hence, nothing in *K. al-qiyās* suggests that the Second Teacher perceived *naqlah* as an invalid technique and one that was restricted to the theological camp. On the contrary, al-Fārābī's methodological comments on analogy in his logical works seem to have been implemented to some extent in his own metaphysical works, and one finds in all of

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[239] Al-Fārābī (1985c, vol. 2, 45 and 1963, 266,18–20).

[240] The warning that appears at the beginning of *K. al-qiyās* can be compared to what al-Fārābī says in *Jam'* about the cosmological examples given in Aristotle's *Topics*: "It has escaped those who disagree [those who claim that Aristotle asserts the eternity of the world] that, first, what is set forth as an example does not stand as a belief and, also, that Aristotle's purpose in *Topics* is not to explain about the world; instead, his purpose is to explain about syllogisms composed of widely-held premises" (al-Fārābī 2001a, 154). In illustrating his logical explanations with cosmological examples, al-Fārābī is perpetuating a long tradition that harkens back to Aristotle's *Topics* and *Posterior Analytics*.

[241] See for instance al-Fārābī (1985a, 120–125 and 1985b, 69–71).

these treatises an identical language of similarity or analogy based on the root *sh-b-h*.[242]

This may explain why, as K. Gyekye has remarked, al-Fārābī argues for a greater tolerance (*musāmaḥah*) toward the use of these analogical techniques. And as N. Rescher notes, al-Fārābī may have been responsible for developing the concept of transference to a considerable degree, since it is not to be found in such an elaborate form in Aristotle or other Greek authors.[243] This hypothesis also agrees with G. Freudenthal's study of al-Fārābī's commentary on the first book of Euclid's *Elements*, which deals with some of the conceptual problems related to mathematical entities. There is a striking parallel in al-Fārābī's method and approach to these subjects, namely, that induction and sense perception represent a starting point for the acquisition of knowledge. Al-Fārābī's cosmological example in the section on *naqlah* and his analogical language in the emanationist treatises illustrate how it is possible to ascribe certain properties to the heavens on the basis of our experience of sublunary bodies. Likewise, in his

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[242] As mentioned previously, terms of similarity from the *sh-b-h* root appear both in al-Fārābī's descriptions of the First and the celestial bodies in *Ārāʾ* and *Siyāsah* and in his exposition of *naqlah* in *Al-qiyās al-ṣaghīr* and *On Interpretation* and form a continuous thread throughout these works. It should be noted that Ibn Rushd adopts a similar view and also justifies the use of analogical reasoning in cosmological inquiries. In his *Jawāmiʿ* 42.4–10 on *On the Heavens*, he writes that "the things from which are acquired the premisses by which man scrutinizes many of the things concerning the heavenly body and through which he aspires to know their causes are [themselves] derived from the things which most closely resemble them, viz. the animate bodies, and especially man." And in his *Talkhīṣ* on the same work (Ibn Rushd 1984a, 196, 13–18), he adds: "clearly this statement about directions in the heavens with reference to those extant in animals is ambiguous, as also the concept of 'ensouled' applied to the heavens. Still, generally accepted premisses may be employed in demonstration in a certain way, especially in matters for which no other deduction is possible" (both passages are translated by Endress 1995, 31). Unlike al-Fārābī, however, Ibn Rushd insists on the ambiguity of this approach. In *Jawāmiʿ*, he notes that "this kind of statement is ambiguous" [*yuqāl bi-l-tashkīk*] and therefore "weak" (Endress 1995, 31). Yet Ibn Rushd also believes that the premises derived from the study of sublunary existents may be used to form a "demonstration" and a "deduction." See also Hyman's comments (in Ibn Rushd 1986, 28–29).

[243] Gyekye (1989, 138); Rescher (al-Fārābī 1963, 93 note 2) mentions *Topics* 108b10–14 and *Prior Analytics* 2.25 as possible starting points for al-Fārābī's transference. Again, it is worth pointing out the potential influence of Book Delta, particularly Delta 16. The fact remains, however, that al-Fārābī devotes a whole section of his commentary to a theory that is not explicitly spelled out by Aristotle. As Rescher (al-Fārābī 1963, 43) notes, al-Fārābī's discussion of transference goes "so far beyond its Aristotelian original … as to qualify, in effect, as an entirely fresh approach to the subject." This illustrates al-Fārābī's willingness to depart from his models.

commentary on geometry he advises the student to begin with bodies and progressively move to more abstract entities such as lines and points. Hence, in geometry, analysis implies a shift from physical three-dimensional bodies to abstract mathematical entities, and in cosmology, transference enables one to progress from the sublunary bodies and their principles (form, matter, and substrate) to more remote entities such as the celestial bodies. Regardless of the disciplinary difference between these two texts, their theories are grounded in similar epistemological and didactic assumptions: sense perception and our direct apprehension of reality are a foundation for further knowledge. Accordingly, one's inquiry should begin from sensible objects and gradually progress toward entities that are more abstract or remote from the human ken.[244] Al-Fārābī himself stresses the didactic quality of this type of method in *Ḥurūf*, when he writes that

> these aspects of similarity [*shabah*] have a certain utility when the student is taught an art due to the speed with which he grasps these notions [*maʿānī*] when their explanation is made with words that resemble those that express notions known by him before receiving this art.[245]

Hence, whether it is analysis in geometry or transference in cosmology, al-Fārābī displays a highly sensitive awareness toward the didactic potential of these techniques.

The foregoing analysis enables us to understand why al-Fārābī relies so ostensibly on analogical language and transfer to describe the celestial bodies in his emanationist treatises, and why he also relies on these techniques in his description of Aristotelian philosophy.[246] The concepts of *asmāʾ manqūlah* and *naqlah* are central to al-Fārābī's perception of how philosophy is formed, since he regards the process of transfer as one of the essential corollaries of the empirical development of the sciences. His remarks on transfer and analogy should therefore

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[244] Freudenthal (1990, 60) describes al-Fārābī's approach as follows: "to the claim that there is no systematic, intellectual, way leading from the world of sensible to that of intelligible, the *Commentary* answers that geometry is a decisive counter-example: the intelligible objects of geometry are obtained from the sensible body through analysis. … To the teachers of geometry, it shows how to guide the student from the sensible objects to the knowledge of the intelligible, ideal, geometrical objects."

[245] Al-Fārābī (1970, sec. 157, 160,1–4, my translation).

[246] An example of the latter appears when al-Fārābī (1961a, 114,19–20) states that "all of what was said about nature should be transferred [*yanbaghī an yunqala*] to the soul." The justification for the use of transfer in this passage is that both nature and soul share similar principles, notably with regard to causality, and that soul is placed ontologically above nature, so that its study follows that of nature.

be read in conjunction with his account of the development of philosophy and logic in *Fī ẓuhūr al-falsafah* and *Ḥurūf*.[247] If we recall that *Ārāʾ* and *Siyāsah* may have been transmitted orally by the Second Teacher or written expressly for didactic purposes, then the role of analogy in these works acquires additional significance. Analogy, especially the method of transference discussed above, possesses undeniable didactic qualities according to al-Fārābī, for it begins with things closest to human experience, i.e., the bodies apprehended by sense perception, and gradually leads the student to an understanding of the entities remote from the senses.

In this regard, one can establish a link between al-Fārābī's emphasis on observation and experience, his conception of the empirical evolution of language, and the value he places on analogical methods such as transference, which take physical reality as a starting point. All of these features testify to a remarkable 'empirical' concern in al-Fārābī's epistemology and approach to philosophy, and they also show how conscientiously al-Fārābī followed Aristotle's directive in *Physics* 1.1.184a.16-17 to "start from the things more knowable and obvious to us and proceed towards those which are clearer and more knowable by nature."[248] On the other hand, if al-Fārābī operated within a fundamentally Aristotelian framework, he departed from this philosophical model by developing concepts that are either briefly mentioned or ignored by the Stagirite.

One question that remains to be answered is whether analogy is able to produce new knowledge or simply represents a didactic method for teaching things that have been ascertained through other types of discourses or through demonstration. Al-Fārābī's inclusion of transference in *K. al-qiyās* and the possibility of shaping analogical reasoning into syllogistic form do not prove analogy's capacity to produce true knowledge. Rhetorical arguments, for instance, can be turned into syllogisms whose conclusions are untrue. Although the extensive use al-Fārābī makes of analogy in his metaphysics and cosmology suggests that it may be conducive to knowledge in its own right, additional comments are required to elucidate this point.

One angle from which to address this problem is to compare transference to other modes of analogical reasoning used by al-Fārābī. Al-Fārābī uses a whole gamut of analogical techniques, many of which

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[247] See Ibn Abī Uṣaybiʿah (1965, 604) for the former; al-Fārābī (1970, part 2, 131–161) and Langhade (1994, 215 ff.) for the latter.

[248] Translated by Hardie and Gaye (in Aristotle 2001).

hinge on the notion of imitation. It is already known that this concept of imitation (*muḥākāt*) occupies a central place in al-Fārābī's political theories. Unlike transference, however, imitation relies primarily on the imagination and is merely a translation into symbols and images of concepts whose real nature may remain unknown to those who use it. This is attested by al-Fārābī in *Falsafat Arisṭūṭālīs* when he writes that

> image-making and imitation [*muḥākāt*] by means of similitudes [*mithālāt*] is one way to instruct the multitude and the vulgar in a large number of difficult theoretical things *so as to produce in their souls the impressions of these things by way of their similitudes. The vulgar need not conceive and comprehend these things as they are*. It is enough if they comprehend and intellect them by means of what corresponds to them.[249]

In a similar vein, *Ārāʾ* states that

> the faculty of representation [or imagination, *al-quwwah al-mutakhayyilah*] … also imitates [*tuḥākī*] the rational faculty by imitating those intelligibles which are present in it with things suitable for imitating them. It thus imitates the intelligibles of utmost perfection, like the First Cause, the immaterial things and the heavens.[250]

In these passages, the connection between imagination and imitation is stressed, as is the main purpose of imitation, which is to produce likenesses of higher cosmological and metaphysical entities. Al-Fārābī believes that imitation and imagination are characteristic of the poetic art, since it is the very essence of poetry to express concepts through symbols, images, and mimetic language in general.[251]

These various points contrast markedly with the analogical technique of transference described by al-Fārābī in his logical treatises. Whereas imitation merely represents or symbolizes a higher order of being, transference is a logical mode of reasoning that has its starting point in the investigation of the physical world. Whereas imitation rests on imagination, transfer involves an act or judgment of the intellect. Finally, while imitation is associated chiefly with the poetic art and plays a key role in al-Fārābī's prophetology and political theories, transfer is a technique described in logic and implemented in physics and metaphysics. This indicates that al-Fārābī's cosmological method does not rely on imitation (*muḥākāt*), which is the product of

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[249] Al-Fārābī (1961a, 85 and 1969, 93, my emphasis).
[250] Al-Fārābī (1985a, 219 and 1985b, 111).
[251] For clear statements to this effect, see *Naṣṣ al-tawṭiʾah* (al-Fārābī 1985c, vol. 1, 57,11); cf. *Falsafah Arisṭūṭālīs* (id. 2001c, 92–93).

the imaginative faculty (*takhayyul*) in humans, but rather on analogical transference (*naqlah*), which is a logical tool that builds on empirical knowledge and experience and involves an operation of the intellect.

To conclude, it appears that al-Fārābī considered some forms of analogy, in addition to experience and observation, as important philosophical tools liable to produce new knowledge. These techniques should consequently be carefully distinguished from the mimetic kind of analogy and the theory of imitation described by al-Fārābī in a political context.[252] Al-Fārābī's theorization of transfer is rooted in the Aristotelian tradition, but it is elaborated and finds a new use in his works. At the same time, however, one may hypothesize that al-Fārābī's emphasis on techniques such as transference is symptomatic of a certain skeptical outlook toward the possibility of obtaining direct and unmediated knowledge of cosmological and metaphysical things. In other words, it is perhaps *because* al-Fārābī was aware of the difficulty of reaching this kind of knowledge that he emphasized the didactic potential of techniques such as experience and transference.

4. *Conclusion*

The previous analysis has identified and discussed some of the main features of al-Fārābī's epistemology and approach to the study of cosmology. While dependent on various Greek and Arabic philosophical and astronomical sources, he did not hesitate to develop his own method and to depart from his models on many key points. I argued that al-Fārābī's method is characterized primarily by the notions of the interrelatedness and cooperation of the sciences. In al-Fārābī's view, there is no opposition or interference between the various philosophical disciplines involved in the study of the cosmos. Astronomy, physics, and metaphysics are all meant to operate in harmony and toward a

[252] This being said, analogy also plays an important role in al-Fārābī's rhetoric and poetics; see Black (1990) and Vallat (2004, 318 ff.). Al-Fārābī wrote a short treatise on this subject entitled *Treatise on Analogy and Poetical Composition* (al-Fārābī 1987, vol. 1, 504–506). The relation between these rhetorical and poetic forms of analogy and the ones discussed and implemented in al-Fārābī's other works remains ambiguous. It is perhaps too early to make a final judgment on this question, but I believe that al-Fārābī probably distinguished between various forms of analogy, some of which he regarded as philosophically unacceptable and downright rhetorical, and others as inclining toward the realm of demonstration. In this respect, Black (1990) stresses the ambiguous status of analogy in the method of the *falāsifah*.

common goal, namely, knowledge of the heavenly world. This cooperation of the sciences leads to a synthetic cosmological picture, in which the mathematical, physical, and metaphysical methods are integrated in a single overarching endeavour.

Al-Fārābī's scheme of the sciences is nevertheless hierarchical and subordinates some disciplines to others: astronomy relies on physics and geometry for some of its principles, while metaphysics *qua* universal science also provides some of the foundational principles used in physics and astronomy. On the other hand, physics and metaphysics can benefit from the results of astronomy, a science which occupies a central place in the study of the cosmos. Hence, al-Fārābī's interdisciplinary method in cosmology is also shaped by his belief in the subordination of the sciences, that is, the idea that they are hierarchically organized and dependent on one another, while at the same time collaborating toward a common end. This position, which partly stems from some of Aristotle's comments in *Posterior Analytics*, was broadly adopted by the Peripatetic circle that flourished in tenth-century Baghdad, as well as by al-Fārābī.[253] Unlike al-Kindī's methodology, which stresses the "epistemic gap" between sensation and intellect, and thus between physics and metaphysics, al-Fārābī's methodology shows "no radical disjunct between the sciences."[254]

Another salient trait of al-Fārābī's epistemology is the emphasis on observation and experience, particularly with respect to his discussion of the astronomical method. In this regard, he departs significantly from the late antique Neoplatonists and was receptive to some of the important developments in scientific methodology that were crystallizing in the Islamic world, partly as a result of the intensive scrutinizing of the heavens that was taking place in astronomical circles. In addition, the analysis underscored the place of analogy and especially the technique of transfer in al-Fārābī's works, which takes its starting point in physical reality and proceeds upward to investigate the more remote or abstract entities. While it may have been triggered

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[253] For insight into this topic in Aristotle, see McKirahan (1978). As Adamson (2007b, 357) notes, "the topic of the subordination of the sciences receives a detailed treatment by some figures in the Arabic tradition, especially al-Fārābī, whose *Attainment of Happiness* is devoted precisely to explaining how knowledge of the various sciences may be achieved, and how the sciences interrelate."

[254] Adamson (2007b, 362 and 358 respectively); in contrast to al-Fārābī, the notion of the subordination of the sciences is absent in al-Kindī's method (Adamson 2007a, 33).

by complex epistemological factors, this technique shows al-Fārābī's interest in the didactic aspect of cosmology and should be construed in parallel to his keen remarks on philosophical terminology and the development of language. With regard to all the points outlined above, al-Fārābī's approach to cosmology and his scientific method mark an important turn in early *falsafah* and also contributed to establishing an influential methodological framework that was used and refined by later thinkers such as Ibn Sīnā and al-Ṭūsī.

CHAPTER TWO

THE ARCHITECTURE OF THE HEAVENS: INTELLECTS, SOULS, AND ORBS

Al-Fārābī's cosmos is a complex one, which consists of various different levels of existents organized hierarchically according to the nobleness of their substance. This chapter aims to deconstruct the various layers of his cosmology in order to explain the activity and relation of the various entities that constitute it, as well as to compare his model to the ancient cosmological trends and identify some of the sources that informed it. The following analysis is based primarily on the emanationist works, *Ārāʾ* and *Siyāsah*, which provide the clearest picture of the Second Teacher's cosmology, although I will refer to other texts as well. The relationship between this cosmological model and the one articulated in *Jamʿ* and *Jawābāt* will be addressed in detail in chapter 3.

1. *The Celestial Bodies*

1.1. *Orbs, Spheres, Planets, and Stars*

The celestial bodies represent one of the main classes of superlunary existents and consist of the orbs, planets, and stars that make up the visible heavens. Although al-Fārābī uses the same Arabic expression to refer to all of these entities, namely, *ajsām samāwiyyah*, it should be noted that it appears in a wide variety of contexts and is therefore ambiguous. It can refer to the orbs alone, which are transparent and invisible to humans, to the orbs together with their planets, or to the planets or stars alone. For example, al-Fārābī states in *Ārāʾ* that "the celestial bodies [*al-ajsām al-samāwiyyah*] are nine altogether."[1] The implication here is that the terms "celestial bodies" refer to the nine main orbs or systems together with the planets or stars they contain. In another instance, however, al-Fārābī writes that the second main orb or system (the orb of the fixed stars) "is one body, which contains a

[1] Al-Fārābī (1985a, 115 and 1985b, 67).

number of bodies [the fixed stars] which have a common motion."[2] In this passage, the term *jism* is used equivocally to refer to the orb of the fixed stars and to the fixed stars themselves. Hence, although the Second Teacher distinguishes conceptually between the orbs, planets, and stars, this distinction is not always reflected terminologically in his works, and the various kinds of celestial entities are often subsumed under the generic term *jism samāwī*. But al-Fārābī occasionally employs a more specific terminology: the term *kawkab* (pl. *kawākib*) refers exclusively to the planets, including the sun and the moon, as well as to the fixed stars, while *falak* (pl. *aflāk*) and *kurah* (pl. *kurāt* or *ukar*) designate the orbs.[3] Al-Fārābī's choice of terms (*kawkab*, *falak*, *kurah,* and *jism samāwī*) overlaps with the terminology of Arabic astronomers and natural philosophers, thereby indicating that his cosmology is grounded primarily in these two sciences.

Al-Fārābī describes the celestial bodies as a particular genus of bodies, the highest in a group of six genera, the others being in a decreasing order of nobleness the "rational animals, non-rational animals, plants, minerals, and the four elements."[4] The celestial bodies are thus distinct from the other genera, all of which reside in the lower world of generation and corruption. Furthermore, each celestial body is the unique individual of its species.[5] It is notable that for al-Fārābī each orb is a

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[2] Al-Fārābī (1985a, 119–121 and 1985b, 69).

[3] Al-Fārābī uses the terms *falak* and *kurah* interchangeably; cf. for instance al-Fārābī (1964, 32 and 1985a, 128–129). Although later authors, especially those working in the *hayʾah* tradition from the tenth century onward, sometimes assigned a fixed meaning to these two terms, *falak* referring to the orbs, *kurah* to the spheres—see for example the definitions provided in al-Ṭūsī's *Tadhkirah* (in Ragep 1993, vol. 1, 97,5 ff., 99,3 ff. and vol. 2, 378–379)—there was no consensus on this issue in early Islamic times, and even Ibn Sīnā in the eleventh century still uses these two terms interchangeably (see Janos 2011). I have nevertheless decided to follow a common practice in the modern historiography on Arabic astronomy by translating *falak* as orb and *kurah* as sphere. The orbs can be concentric or eccentric vis-à-vis the earth, which they in any case surround. The spheres are spherical bodies attached to the orbs that do not surround the earth and in which the planets are embedded. It is important to stress that according to al-Fārābī both terms refer to concrete bodily entities.

[4] Al-Fārābī (1964, 31); McGinnis and Reisman (2007, 82). Cf. with the classification of bodies in his *K. al-maqūlāt* (1985c, vol. 1, 91,7–8). The term *jism* is, together with *jirm* and *badan*, the main Arabic word used in natural philosophy to render Aristotle's σῶμα. Unlike Greek, however, which possesses generic terms such as οὐράνιοι to designate the celestial bodies in opposition to sublunary bodies, the Arabic *jirm* and *jism* can refer to both the sublunary and the superlunary body.

[5] Al-Fārābī (1985a, 120–121 and 1985b, 69) writes in *Ārāʾ* that "all these bodies [i.e., the celestial bodies] have one and the same genus [*jins*] while differing in species [*al-anwāʿ*]. But in each of these different species only one body can exist and no other

"spherical body" (*jism kurī*), despite the fact that it is imperceptible to the senses.[6] As bodies, the orbs and planets may be defined primarily by their corporeal qualities: they have shapes (*ashkāl*), volumes (*aʿẓām*), and sizes or measures (*maqādīr*).[7] But since they represent a special class of bodies, al-Fārābī believes that they have only the noblest corporeal qualities (spherical shape, luminosity, and circular motion)[8] and possess only the "most excellent categories."[9] In addition, he, like most Peripatetics, holds that the orbs and planets do not possess any of the qualities attached to sublunary bodies, such as coldness, heat, dryness and moisture. While it is clear that the heavens have the purest visible and kinematic qualities, al-Fārābī does not specify what tactile qualities they possess, i.e., whether the orbs are solid or liquid, an important cosmological question in the Medieval Latin tradition.

The most conspicuous qualities of the heavenly bodies from the viewpoint of an observer situated on earth is, first, their luminosity, and second, their regular and harmonious circular motion. These phenomena highlight their noble nature and set them apart from other types of corporeal beings characterized by rectilinear motion. With regard to the former, the Second Teacher believes that the celestial bodies emit light, which is in turn responsible for generating heat in the sublunary world. It is this light and heat caused by the celestial bodies that enable the generation of plants and animals to take place. In one of his treatises on astrology, al-Fārābī mentions two different views on the luminosity of the heavens that he attributes to the ancients (*al-qudamāʾ*). The first holds that the sun alone emits light. According to the second, all the fixed stars are luminous in themselves, while the other wandering planets reflect the light of the sun. In this text, al-Fārābī seems hesitant as to which interpretation to follow and does not take sides.[10]

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can share that species with it." A similar view appears in *K. al-wāḥid wa-l-waḥdah*, where al-Fārābī (1989, 56) explains that "moonness" (*qamriyyah*) belongs to the moon alone, which is the single existent of a single species. The justification for making each celestial body a unique species is that its substrate can only receive one form and cannot have other forms opposed to the one it already has. For a discussion of this issue in Ibn Rushd, see Di Giovanni (2006), and in Medieval Latin cosmology, see Grant (1994, 220–223).

[6] Al-Fārābī (1985a, 118–119 and 1985b, 69).
[7] Al-Fārābī (1949, 84 and 1985a, 123–125).
[8] Al-Fārābī (1985a, 123–125 and 1985b, 71).
[9] Al-Fārābī (1964, 53–54).
[10] Al-Fārābī (1992, 292).

Ārāʾ provides additional information on this issue. Al-Fārābī explains that only "some parts" (*ajzāʾ*) of the heavens produce light, namely, *al-kawākib*, while other parts—presumably the orbs—are transparent and both produce their own light and receive light from *al-kawākib*. This statement is ambiguous, to say the least. First, it seems to imply that the orbs (which are the only transparent celestial bodies) not only receive light, but also emit a light of their own. This is a rather strange idea, since this light is not perceptible from a human viewpoint on earth. Second, it is unclear whether the term *al-kawākib* here refers to the fixed stars or the planets (or both). This passage is thus of little help, but it would seem that, according to al-Fārābī, both the orbs *and* planets or stars emit their own light.

Turning to the other main visible quality of the heavenly bodies, al-Fārābī holds that the celestial orbs perform eternal and harmonious rotations around the earth.[11] This eternal circular motion is the result of their uninterrupted contemplation of the higher principles, whose perfection they strive to attain. It reflects the desire of the heavenly bodies to acquire the last degree of perfection necessary to complete their substance. But since they are embedded in a material substrate, they can never attain this perfection, and can only express it through circular motion, the circle being the most perfect shape. Furthermore, heavenly motion fulfills an important role in al-Fārābī's physics. The various celestial motions act as accidental causes on the sublunary world and are responsible for governing the processes of generation and corruption. More specifically, through their various movements, the orbs prepare sublunary matter for the reception of form and participate in the mixture of the elements that constitute the hylomorphic bodies. Finally, it should be noted that al-Fārābī rejects the claim of the Pythagoreans that the orbs produce a celestial harmony as a result of their motions.[12]

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[11] Only a few remarks will be given here, as this topic is covered in depth in chapter 4.

[12] In *Mūsīqā* (al-Fārābī 1960a, 89) he writes: "As for what the followers of Pythagoras [*Āl Fīthāghūras*] believe concerning the orbs and stars, namely, that they produce a harmonious melody through their motions, this is plainly wrong. For it was briefly shown in [the book on] natural philosophy that their view is not possible and that the heavens, orbs, and stars [*al-samāwāt wa-l-aflāk wa-l-kawākib*] cannot emit sounds through their motions." Aristotle himself had refuted the Pythagorean doctrine of the harmony of the spheres in *On the Heavens* 2.9; see also Simplicius' (2004a, ch. 2.9) commentary.

Like all other bodies, the orbs, planets, and stars are composite substances. However, unlike sublunary bodies, which are composed of form and matter, al-Fārābī tells us that they are composed of the two principles of soul (*nafs*) and substrate (*mawḍūʿ*). Soul and substrate can be compared to sublunary form and matter, the soul acting like the form and the substrate acting like the matter, but they are not strictly speaking hylomorphic beings in the sense that, say, a bed is composed of form (its shape) and matter (its wood). Al-Fārābī's comparison between soul-substrate and form-matter should thus be construed as a didactic aid to drive home the point that the celestial bodies are not perfectly simple substances and to clarify how the celestial souls relate to the celestial bodies. The duality of soul and substrate that characterizes the orbs and planets makes them the first composite beings and places them below the immaterial and intellectual beings in the ontological hierarchy. As al-Fārābī writes,

> the substances of the celestial bodies are divided, inasmuch as they are substances, into many things. They are in the first rank of the ranks of beings that are deficient, due to the fact that the thing by virtue of which they are actually substances [i.e., their soul] requires a certain subject. Thus, they resemble the substances that are composed of matter and form.[13]

It is noteworthy that in stressing the compositeness of the celestial bodies, al-Fārābī departs from Aristotle and many of his followers, who had emphasized the simple nature of the orbs and defined aether as a perfectly homogeneous substance pervading the entire heavens. Al-Fārābī, in contrast, stresses the composite nature of the heavens and omits any reference to a simple celestial matter.

1.2. *Al-Fārābī and Ptolemy on the Planetary Models*

Al-Fārābī's descriptions of the spatial arrangement of the celestial bodies are very brief and tantalizing, and there are many points he leaves unsettled. We depend primarily on one section of *Ārāʾ* to solve these issues. Nevertheless, by gathering the various hints dealing with this subject throughout his corpus, it is possible to reconstruct an adequate picture of the cosmos as he conceived it. At a basic level, al-Fārābī fully endorsed the geocentric cosmological model that was prevalent in

[13] Al-Fārābī (1964, 53) and McGinnis and Reisman (2007, 94).

antiquity, which posits an immobile earth lying at the center of the universe and various celestial orbs arranged in concentric layers around it. This scheme was outlined both in Aristotle's physical works and in the Greek astronomical texts transmitted to the Arabic world, which, it should be noted, often drew on Aristotelian physical principles.

However, when it comes to the arrangement of the orbs and planets, it is Ptolemy's works that were the main source of inspiration for the Second Teacher. According to al-Fārābī, the heavens are divided into what he calls "groups" (sing. *jumlah*, pl. *jumal*),[14] a term which, to my knowledge, does not have an astronomical or philosophical pedigree. Al-Fārābī establishes a hierarchy among the various cosmic groups, and the orbs are organized in ranks (*marātib*) in a descending order of excellence.[15] There are in total nine *jumal*, which correspond to the nine main celestial orbs inherited from Ptolemaic astronomy. The farthest, outermost orb, also called 'the first heaven' (*al-samāʾ l-ūlā*) and 'the first body' (*al-jism al-awwal*), is a starless and planetless orb, which is nobler in rank than the other orbs, due to its essential proximity to the first separate intellect. This first orb surrounds all the other orbs and causes the daily rotation of the heavens from east to west.[16] Below it is 'the orb of the fixed stars' (*kurat al-kawākib al-thābitah*), which is characterized by its dual motion—one being the motion of the outermost orb, the other a retrograde motion from west to east called precession—and by the fact that the stars are 'fixed' in their orb and hence do not change position vis-à-vis one another. Next are the orbs of the seven planets, whose descending order according to al-Fārābī is as follows: Saturn, Jupiter, Mars, the sun, Venus, Mercury, and the moon. The orb of the moon is thus the last orb, which is closest to the earth, and whose concave surface marks the separation between

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[14] This term appears in *Ārāʾ* (al-Fārābī 1985a, 118–119 and 1985b, 69).

[15] Al-Fārābī (1985a, 114–115 and 1985b, 66–67).

[16] The outermost orb was accepted by most Arabic philosophers and astronomers, probably on the basis of certain passages of Ptolemy's *Planetary Hypotheses* (see Goldstein 1967, 38–42). Arabic astronomers also call it "orb of orbs" (*falak al-aflāk*) and the "encompassing orb" (*al-falak al-muḥīṭ*). Some late antique Greek commentators, such as Ammonius and Simplicius, seem to have taken into consideration the possibility of its existence without endorsing it systematically (Simplicius 2004a, 462,20–25). By the time of Ibn Sīnā, however, belief in the existence of this orb was firmly established, and its discovery was attributed to Ptolemy himself; see *K. al-najāh* (Ibn Sīnā 1985, 303), *Dānesh-nāmeh* (id. 1986, 142), and *Metaphysics* of *Shifāʾ* (id. 2005, 317). For a discussion of how this ninth orb is responsible for the daily rotation of the heavens, see Ragep (1993, vol. 2, 409).

the sublunary world and the heavens proper. Below the orb of the moon, one finds the various regions of the elements in their pure form, starting with fire, then air, water, and earth. This order was the one recommended by Ptolemy, and it was subsequently adopted by most Arabic astronomers.[17] In brief, seven of the nine orbs contain a planet (including the sun and the moon), one the stars, and one is starless and planetless (see Figure 3).

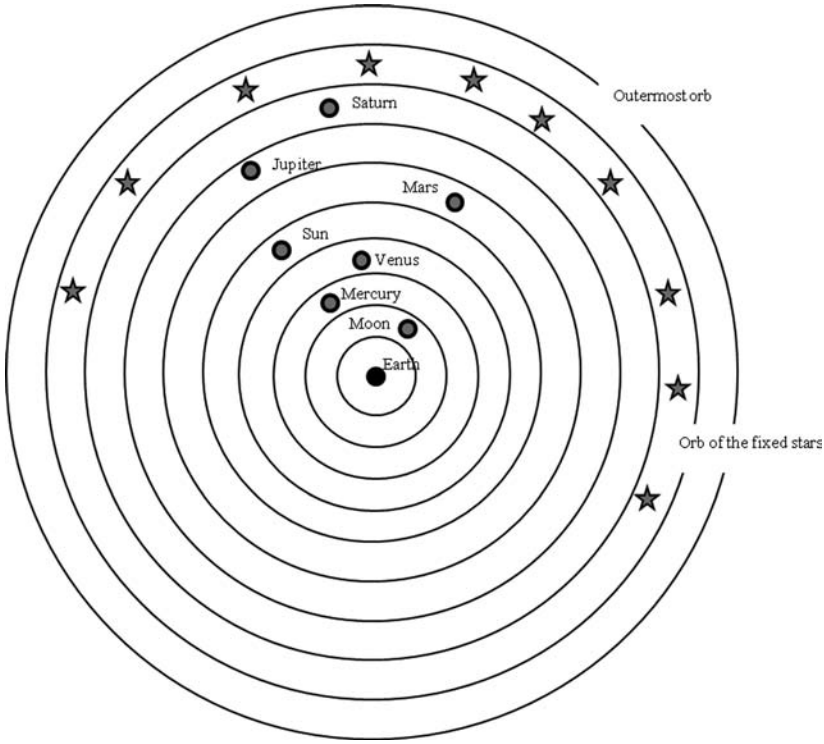

Figure 3. The main orbs and the arrangement of the planets

When taken as a whole, these various orbs and what they contain form the physical and corporeal world, outside of which nothing exists, not even void. This raises the question of the place (*makān*) of the heavens, an issue about which al-Fārābī is silent in his extant works. Nevertheless, al-Fārābī's view on this old cosmological problem can be

[17] This order appears in Ptolemy's *Hypotheses*; see Goldstein (1967, 6a).

partly reconstructed from some disparate comments in the works of Ibn Bājjah and Ibn Rushd. When discussing physical problems, these two authors often refer to the works of the Second Teacher, especially his commentary on *Physics* and his treatise *On Changing Beings*. Apparently, al-Fārābī believed that the heavens possess an essential place defined by the relation of the two bodies that are the heavens and the earth. More specifically, the position of the heavens is determined by the convex surface of the body around which they rotate and which they surround, i.e., the earth and the regions of the elements.[18]

Another issue that is difficult to settle due to the sparse evidence concerns the spatial relation of the orbs and whether these are in contact or not. This problem was to become a controversial issue in Medieval Latin cosmology, but it does not seem to have interested early Arabic philosophers much. With regard to al-Fārābī, the only hint appears in *Falsafat Aristūṭālīs*, where he explains (on behalf of Aristotle) that the orb of fire has "one of its two surfaces contiguous to the concave of the celestial bodies [i.e., to the surface of the orb of the moon] [*yujāwiru aḥad satḥayhī muqaʿʿar al-ajsām al-samāwiyyah*]."[19] The cosmos is therefore a plenum consisting of contiguous orbs, which does not allow for the existence of void or gaps between the various bodies that occupy it. Although al-Fārābī is merely reporting the opinion of Aristotle, it is likely that he would have adhered to this view as well.

Yet another ambiguous point is whether the nine celestial "groups" (*jumal*) mentioned by al-Fārābī each consist of one or several orbs, that is, whether they consist only of a planet-bearing orb or of a planet-bearing orb together with other secondary or subordinate orbs responsible for the planet's motion.[20] This issue, which is of crucial importance

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[18] Lettinck (1994, 297–303, 307– 315). Ibn Bājjah followed al-Fārābī's physical theory implicitly, since he does not cite the Second Teacher by name. Ibn Rushd, however, explicitly ascribes this view to al-Fārābī and notes that this was also the view followed by Ibn Bājjah. Ibn Rushd himself adheres to this definition of place, but unlike al-Fārābī and Ibn Bājjah, he considers the heavenly place to be accidental, not essential. All of these thinkers depart from earlier commentators, such as Alexander, according to whom the heavens did not have a place, be it accidental or essential. Once again, we witness the degree of influence that al-Fārābī's physical ideas exercised on later Arabic thinkers, in this case with regard to a cosmological puzzle in Aristotle that had generated many different interpretations among the commentators. For an analysis of this same issue in the works of Ibn Sīnā, see McGinnis (2006).

[19] Al-Fārābī (1961a, 106,14–15 and 2001c, 110).

[20] By secondary or subordinate orbs I mean the smaller eccentric or concentric orbs and the epicycle spheres contained in the main orb of a planetary system; for a discussion of such planetary models, see Murschel (1995).

to understand al-Fārābī's theories of celestial motion and to define his place in the history of medieval cosmology, is closely related to the question of whether his cosmological model is homocentric, like Aristotle's, or includes the Ptolemaic theories of the eccentric and epicycle. One should not assume that al-Fārābī automatically adopted these theories as a result of his acquaintance with the Ptolemaic works. The number of post-Ptolemaic thinkers who either neglected or openly rejected the Ptolemaic planetary models is by no means insignificant and includes Alexander of Aphrodisias, Themistius, and Proclus in the Greek tradition, as well as Ibn Rushd, al-Biṭrūjī, and several other Arabic thinkers of al-Andalus in Islam. The evidence for al-Fārābī's adherence to the Ptolemaic planetary models must therefore be discussed and established and should not be taken for granted. One should also address the corollary question of whether al-Fārābī defined the spheres in a purely geometrical way or as concrete entities embedded in the physical cosmos.

It is frequently alleged in the secondary literature that al-Fārābī's cosmos consists of only nine celestial orbs.[21] Indeed, in his account of the superlunary beings in *Ārāʾ*, he refers only to the nine orbs that are caused to exist by the separate intellects. But in this passage, it is likely that al-Fārābī is exposing a simplified cosmological model for the sake of clarity. There are many hints suggesting that he endorsed a more complex system that included smaller, subordinate orbs and spheres. To begin with, we know that al-Fārābī wrote a commentary on *Almagest*, which must have discussed at length the function of these models in planetary motion. Although some Arabic authors criticized Ptolemy, especially from Ibn al-Haytham's time onward, it is unlikely that al-Fārābī's commentary would have amounted to a wholesale rejection of the Ptolemaic system, and it is much more plausible that he endorsed its main features. Considering that al-Kindī before him and Ibn Sīnā after him followed Ptolemy's astronomy, it would be all the more surprising if al-Fārābī had rejected it.

With respect to the textual evidence supporting this hypothesis, al-Fārābī writes in *Ārāʾ* that "the third group to the ninth group [i.e., the main planetary orbs, including those of the sun and the moon]

[21] Walzer (in al-Fārābī 1985a, 364); Davidson (1992, 45): "the version of the [astronomical] scheme presupposed by Alfarabi gave its attention to the primary celestial spheres and ignored the subordinate spheres"; Griffel (2009, 136).

each contain bodies [*ajsām*] whose motions are several and different."[22] The plural noun *ajsām* in this sentence must refer to subordinate orbs and spheres—presumably the eccentrics and epicycles—in addition to the planets, since the main orbs only contain one planet, the sun, or the moon, and therefore the reference to several bodies (*ajsām*) and several motions would not be justified if al-Fārābī was referring to the planet alone.

This interpretation of the *Ārāʾ* excerpt is strengthened by other passages in the Fārābīan corpus, although it must be said that these are sparse and often obscure. In *Mūsīqā*, the Second Teacher explicitly refers to the Ptolemaic theories of eccentrics and epicycles in the course of an argument designed to show that the astronomer must rely on physical principles in order to explain the causes of the planets' motions. Al-Fārābī states that the astronomer "can only explain these causes, such as the eccentrics and epicycles, if he posits that these planetary motions are in themselves regular."[23] This passage shows beyond doubt that al-Fārābī was aware of the existence of these astronomical devices. Accordingly, and returning to *Ārāʾ*, al-Fārābī describes one kind of celestial body as "a sphere or a corporeal circle" (*kurah aw dāʾirah mujassamah*).[24] Shortly thereafter, he again mentions other "corporeal circles" apart from the main orb: "Each of the spheres and the corporeal circles [*dawāʾir mujassamah*] in them has an independent motion of its own."[25] There is little doubt that the formula *dawāʾir mujassamah* refers to the eccentrics and epicycles contained in the main orbs and which are responsible for the particular motions of each planet. *Dāʾirah* is the Arabic counterpart of the Greek κύκλος, which in general does not convey a sense of corporeality. But by specifying that these are "corporeal" (*mujassamah*) circles, and by locating them "within" the main orbs (*fīhā*), al-Fārābī clearly defends, first, the existence of the

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[22] Al-Fārābī (1985b, 69, my translation). The Arabic text reads: *wa-l-thālith, wa-mā baʿduhū ilā tamām al-tisʿah, yashtamilu kull wāḥid minhā ʿalā ajsām kathīrah mukhtalifah fī ḥarakāt mā*. Walzer's edition and translation of this passage (in al-Fārābī 1985a, 119–121), which differs from Nādir's, is probably incorrect, since it ascribes only "one body" (*jism wāḥid*) to each group, which consists of a planet and several orbs and spheres. Walzer provides the alternative reading *minhā ʿalā ajsām kathīrah*, which is given by Nādir and which should be preferred.

[23] Al-Fārābī (1960a, 102).

[24] Al-Fārābī (1985a, 128–129 and 1985b, 73).

[25] Al-Fārābī (1985a, 128–129 and 1985b, 23): *wa-li-kull wāḥid min al-ukar wa-l-dawāʾir al-mujassamah allatī fīhā ḥarakah ʿalā ḥiyālihā*."

eccentrics and epicycles in addition to the main orbs, and second, the physical nature of these planetary devices.[26]

Finally, and to lend additional weight to this view, in the same section of *Ārāʾ* al-Fārābī discusses the shifting positions of the celestial bodies, mentioning the fact that they "sometimes come together [*tajtamiʿu*] and sometimes separate [*taftariqu*] … sometimes come near [*taqrubu*] some bodies on the lower level and sometimes recede [*tabʿudu*] from them."[27] These comments are echoed in *Siyāsah*, where the celestial bodies are said to alternate between opposition and conjunction and to have varying distances vis-à-vis the earth.[28] It is clear that these remarks cannot apply to a system of homocentric orbs, in which the relation between the planets and stars and the earth remains virtually the same. It is much more likely that they refer instead to a Ptolemaic model whereby the planets conjoin and separate as a result of the motion of the epicycles and eccentrics which carry them along. Indeed, the eccentrics and epicycles could account much more effectively than the concentric orbs for the varying motions and distances of the stars and planets that could be perceived from earth. This helps to understand why they gradually became the favoured models of astronomers and why the concentric system lost its popularity.

Apart from these brief comments, al-Fārābī says little about the organization of the orbs, and he does not elaborate detailed planetary models using epicycles and eccentrics in his philosophical works.[29] In spite of this, the evidence adduced above, combined with the fact that al-Fārābī commented on *Almagest*, is sufficient to conclude that his cosmology relied on the theories of the epicycles and eccentrics and is therefore closer to Ptolemy's astronomical model as depicted in *Almagest* and *Planetary Hypotheses* than to Aristotle's homocentric

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[26] Ibn Sīnā also clearly ascribes corporeal existence to the eccentrics and epicycles, as can be seen in *Ishārāt* (Ibn Sīnā 1951, 419/168–169).

[27] Al-Fārābī (1985a, 130–131 and 1985b, 74–75).

[28] Al-Fārābī (1964, 55).

[29] These models may have been discussed at greater length in a physical-astronomical context in al-Fārābī's no longer extant treatise *Fī anna ḥarakat al-falak sarmadiyyah*. Reference to the epicycles also appears in *Taʿlīqāt* (al-Fārābī 1992, sec. 68, 392), where the author explains that "the planets are in themselves also moving around their own centers in epicyclic spheres" (*wa-l-kawākib ayḍan fī dhātihā mutaḥarrikah ʿalā marākizihā anfusihā fī aflāk tadāwīrihā*). But this treatise was probably composed much later in the Ibn Sīnā circle, as is argued in appendix 1.

system.[30] In adopting the Ptolemaic planetary devices, al-Fārābī follows the example of his illustrious predecessor al-Kindī, who often mentions the eccentrics and epicycles in his treatises, as in *On the Proximate Efficient Cause*.[31]

One point deserves further comment. The evidence discussed above indicates that al-Fārābī regarded the eccentrics and epicycles as physical entities embedded within the main orbs of each system. According to al-Fārābī, all the celestial orbs, including the subordinate orbs and spheres, are spherical bodies (sing. *jism kurī*).[32] This explains why he states in *Ārāʾ* that there are several bodies (*ajsām*) within each main orb and that these bodies have several different motions, since he is referring in this instance not only to the planets, but also to the eccentrics and epicycles necessary to explain these planets' particular motions. In turn, we may conclude that the term "group" (*jumlah*), which al-Fārābī uses to describe the main spherical layers of the cosmos, refers to the entire planetary system, i.e., the planet, the main orb, and the smaller subordinate orbs and spheres it contains, all of which possess a corporeal existence.[33]

These results are significant insofar as they shed light on al-Fārābī's position vis-à-vis the much debated problem of the conceptual versus extramental existence of the planetary devices. Indeed, the relation between the mathematical models posited by astronomy and the physical proposition of the materiality of the orbs represents a controversial issue both for ancient and modern scholars.[34] In the case of

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[30] This basic fact has not always been recognized in past studies on the Second Teacher. In his classic but outdated work on al-Fārābī, Madkour (1934, 90–94) describes his cosmology as reproducing that of Aristotle in *Metaphysics*, Book Lambda, and does not recognize its basic Ptolemaic character. No mention is made of the eccentrics and epicycles.

[31] McGinnis and Reisman (2007, 12–13).

[32] Al-Fārābī (1985a, 118–119, 122–123 and 1985b, 69 and 71).

[33] The existence of these subordinate orbs and spheres within the main orbs appears to have been accepted by many authors of the classical and post-classical periods, such as Ibn Sīnā, al-Ṭūsī, al-Ījī, Fakhr al-Dīn al-Rāzī and others. For instance, al-Ṭūsī states in his *Tadhkirah* (Ragep 1993, 2.2.4, vol. 1, 110–111): "Each of these seven orbs [i.e., the main planetary orbs] must be further divided into other orbs so that its planet's compound motion results from them, consistent with what is observed"; cf. al-Ījī's *Kitāb al-mawāqif fī ʿilm al-kalām* (al-Ījī [n.d.], 200).

[34] For a comprehensive discussion of this topic among the ancient astronomers, see Duhem (1908/1990 and 1913–59, vol. 2, 36–8, 67 ff.); see also L. Wright (1973) and Evans (2003). In the first work, Duhem adopted an exaggerated 'instrumentalist' framework, but his view is expressed in a more nuanced way in his later magnum opus. The issue of the materiality of the orbs was also discussed by Simplicius

al-Fārābī, in conceiving the eccentrics and epicycles as solid, corporeal entities, he definitively sides with the realist camp, and he openly acknowledges that the mathematical planetary models he inherited from Ptolemy are representations of bodies that exist objectively in the heavens. This in turn explains why there is a visible attempt in al-Fārābī's works to integrate astronomical elements in a physical and metaphysical framework, as can be seen clearly in *Ārāʾ*, for instance. It should be noted that in upholding this view, al-Fārābī agrees not only with most other *falāsifah*, such as Ibn Sīnā and al-Ṭūsī, but also with many ancient Greek thinkers and with Ptolemy himself in *Planetary Hypotheses*.[35]

To summarize, then, al-Fārābī endorsed various key features of Ptolemaic astronomy: the arrangement of the planets as advocated by Ptolemy; the existence of a ninth, starless orb responsible for the diurnal motion of all the orbs; and the planetary devices of the eccentrics and epicycles, here interpreted as concrete entities. This suggests that al-Fārābī deliberately embraced a harmonizing approach to physics and astronomy and that he desired to some extent to reconcile his philosophical ideas with the most up-to-date astronomical knowledge. Like Aristotle, who had drawn on the astronomical theories of Eudoxus and Callipus, and Ibn Sīnā, who was himself a practicing astronomer and devoted part of his *Shifāʾ* to commenting on *Almagest*,[36] al-Fārābī was genuinely interested in astronomy and assimilated its findings to other aspects of his philosophy. In this respect, it is not surprising that the Second Teacher chose Ptolemy's *Almagest* as a model. While al-Fārābī considered Aristotle's corpus to be the pinnacle of philosophy, there is no doubt that he and the *falāsifah* in general regarded Ptolemy as the main authority in astronomical matters. It would therefore have seemed natural to al-Fārābī to discard the outdated astronomical model elaborated by the Stagirite and to favour the more recent astronomical theories and findings of his contemporaries, who were elaborating on the Ptolemaic legacy. Finally, it is noteworthy that al-Fārābī's strategy to harmonize astronomy, physics,

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and Proclus in his *Hypotyposis*, about which see Lloyd (1978) and Sorabji (2004, vol. 2, 376–80). For further insight into the Arabic tradition and into Duhem's interpretation of it, see Ragep (1990).

[35] For Ptolemy, see Evans (2003); for Ibn Sīnā and Ṭūsī, Janos (2011).

[36] For an assessment of Ibn Sīnā's astronomical works, see Ragep and Ragep (2004).

and metaphysics is apparent both in his scientific method, as was shown in the previous chapter, as well as in the general structure of his cosmology.

1.3. *The Celestial Souls*

The celestial bodies are by no means the only existents of the heavens. Above them in rank and nobleness are various other principles that will be discussed in the rest of this chapter. One of the remarkable features of al-Fārābī's cosmology is the consistent distinction that is made between two sets of celestial intellects: the rational souls that inhere in the celestial bodies on the one hand, and the separate intellects on the other. The present concern is with the former. Al-Fārābī does not use a specific technical term to refer to these souls and simply calls them *anfus al-ajsām al-samāwiyyah* ("the souls of the heavenly bodies"). Although the ensoulment of the heavens represents a ubiquitous and quasi-universal religious and mythological tenet, this doctrine had a long and variegated history in Ancient Greek philosophy. Suffice it to say here that Plato (or rather the characters of his dialogues) discusses the ensoulment of the heavens in several of his works, such as *Timaeus* (36E-39A) and *Laws* (896B-897C and 967D-E), a view reproduced by the author of the *Epinomis* (981E, 983A-C). The evidence in Aristotle is somewhat more ambiguous, but several passages in his works seem to defend a similar view.[37] At any rate, the later commentators took it for granted that Aristotle upheld the ensoulment of the heavens.[38] This doctrine was then conveyed to the Islamic milieu by some philosophical texts translated into Arabic, such as *Theology of Aristotle* and the treatise *Mabādiʾ* attributed to Alexander. Al-Kindī's works also attest that this theory was endorsed by some thinkers during the early centuries of Islam.[39]

Al-Fārābī describes the celestial soul as a principle that constitutes part of the substance of the celestial body, the other being substrate

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[37] See *On the Heavens* 2.2 and 2.12; and *Metaphysics* 12.8.1074b1-15, where Aristotle endorses the age-old view that the celestial bodies are gods.

[38] See Simplicius (2004a, 378,1-382,1.32), who also discusses the view of Alexander on this subject.

[39] Badawī (1977b, 104), Lewis (1959, 77, 181), al-Kindī (1950–53, passim), Gobillot (2002), and Alexander (2001, 46–47, 52–53, and passim). For an overview of the animation of the heavens in ancient thought, see Wolfson (1962) and Endress (1995). Wolfson traces the continuity of the idea of an ensouled heaven from the Greek to the Islamic period via the church fathers.

(*mawḍūʿ*). Unlike the separate intellects, which are immaterial, the celestial souls do not exist separately from the orbs, but rather as part of them. They are compared to forms (*ṣuwar*), with the implication that they inhere in the celestial substrate in the way that sublunary forms inhere in matter. The identification of soul with form has a long history in ancient Greek thought, which begins with Aristotle's assertion in *On the Soul* 2.1 that "the soul must be a substance in the sense of the form of a natural body having life potentially within it."[40] Most of the Peripatetic and Neoplatonic philosophers who flourished after the Stagirite accepted this equation, while striving at the same time to address some of the problems it raised and to integrate the concept of soul in a new cosmological framework.[41]

Al-Fārābī was obviously aware of the main propositions of *On the Soul*, such as the one cited above, and of Aristotle's definition of the human soul as form.[42] But the origin of al-Fārābī's comparison between the celestial soul and form should probably be sought elsewhere, since Aristotle himself does not to my knowledge make this connection in a cosmological context. Indeed, *On the Soul* and its commentaries are primarily interested in the human soul and intellect. For this reason, the description of celestial souls as forms most likely represents a later cosmological development triggered by the commentatorial tradition. As C. Genequand has shown, it is most likely in Alexander's *Mabādiʾ*

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[40] *On the Soul* 2.1.412a20-21, translated by Smith (in Aristotle 2001).

[41] See Fotinis (in Alexander 1980, 163–183) for a discussion of the relation between soul and form from Aristotle to Alexander; for an overview of the various interpretations of *On the Soul* in late antique philosophy, see Blumenthal (1996). Davidson (1992, ch. 2), "Greek and Arabic Antecedents," also provides information on the Greek background of al-Fārābī's, Ibn Sīnā's, and Ibn Rushd's theories. A further level of exegetical difficulty was created by Aristotle's definition of soul as an actuality in *On the Soul* 2.1.412a.28-29, and more precisely as the "first grade of actuality of a natural body possessing life potentially in it" (translated by Smith in Aristotle 2001). Subsequent thinkers exerted much effort to clarifying the relation between soul, form, and the various grades of actuality, a task rendered more difficult in the Neoplatonic context by the postulation of various super-cosmic and encosmic souls and by new definitions of potency and actuality.

[42] Surprisingly, no commentary on *On the Soul* is ascribed to al-Fārābī by the early bio-bibliographers, although he did write a commentary on Alexander's *Treatise on the Soul* (*Maqālah fī l-nafs*). Moreover, he may have known Alexander's *De intellectu* and Themistius' paraphrase of *On the Soul*, which were translated into Arabic; see Davidson (1992, 7–9) and more recently Vallat ("L'intellect selon Fārābī: la transformation du savoir en être," forthcoming). For a study of the reception of Aristotle's psychology in Arabic philosophy, see Gätje (1971).

that al-Fārābī found a precedent for this view, which is repeated on numerous occasions in this work.[43]

In spite of their proximity to the heavenly bodies, al-Fārābī conceives of the celestial souls essentially as intellects. In his human psychology, al-Fārābī makes an ontological and epistemological distinction between soul (*nafs*) and intellect (*ʿaql*). When it comes to the celestial bodies, however, both concepts overlap and are used synonymously: the orbs have rational souls that contemplate intelligibles, and this activity makes them intellects. This appears clearly in *Ārāʾ* and *Siyāsah*, where al-Fārābī explains that the heavenly substrates "do not prevent their forms [i.e., the celestial souls] from thinking and from being intellects [*ʿuqūlan*] in their essences";[44] that "despite the fact that the soul that is in each of them [the celestial bodies] is something existing in a substrate, it is … an actual intellect.";[45] and that "the celestial souls have neither sensory perception nor imagination; rather, they have only the soul that intellects."[46]

Al-Fārābī repeatedly mentions the fact that the celestial bodies "intellect" or "contemplate" (*ʿaqala*) the higher principles.[47] In spite of their intellectual nature, however, the celestial souls are more complex than the separate intellects, due to their varied objects of thought. Moreover, they inhere in a substrate (*mawḍūʿ*), to which they are closely

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[43] Alexander (2001, 52–53, 82–83, 100–101) and Sharples (2003, 199). Alexander was famous in antiquity for making soul the true nature of the celestial bodies, thus emphasizing their psychological qualities and downplaying their material qualities. See Simplicius' *On the Heavens* commentary (2004a, 380, 30-382, 10). The equation of soul and form is later adopted by Ibn Sīnā as well (1985, 314 and 2005, 311, 31–32). Some ambiguity remains in the case of al-Fārābī as to how form can be applied to the superlunary beings, since he is in general quite clear that form cannot exist without inhering in a material substrate. This tension will be addressed later on with respect to the intellects.

[44] Al-Fārābī (1985a, 121–123, translation slightly revised, and 1985b, 70).

[45] Al-Fārābī (1964, 53), McGinnis and Reisman (2007, translation revised). This Arabic passage lacks felicity of expression, but the general meaning, i.e., that the sphere-souls are intellects, is clear.

[46] Al-Fārābī (1964, 34).

[47] See for example al-Fārābī (1964, 34, and passim). Unlike al-Fārābī, Ibn Sīnā in *Shifāʾ* (1983, 383, 14 ff., 387, 5) maintains a sharp distinction between soul and intellect in his cosmology and does not define the celestial souls as intellects. The reason for this may be that Ibn Sīnā ascribes imagination, knowledge of particulars, and a certain degree of corporeality to these souls, which implies that they cannot be pure intellects. As Ibn Sīnā (2005, 312,4 ff.) explains: "As for the motive soul, it is—as this became evident to you—corporeal, transformable, and changeable, and it is not denuded of matter; rather, its relation to the heavenly sphere is the same as the relation of the animal soul that belongs to us."

connected and which makes the substance of the celestial bodies composite. These defects affect the nature of the celestial souls and prevent them from being pure intellects. This is why one reads in *Ithbāt* that the heavenly bodies do not possess a "pure intellect" (*ʿaql ṣirf*).[48]

Unlike al-Kindī, his philosophical predecessor, al-Fārābī does not endow the heavenly bodies with the senses of sight and hearing. The usual argument for justifying sensation at the celestial level, and the one that appears in al-Kindī's works, is that if the celestial bodies are the best and noblest of bodies, they must possess the most excellent senses (sight and hearing), or else the perishable animals of the sublunary world could be said to be nobler on this ground.[49] Although al-Fārābī does not explain why he rejects this argument and the theory of celestial sensation, he might have found it superfluous to ascribe sensation to the celestial bodies in addition to intellection. Alternatively, one may explain the discrepancy in the two thinkers' cosmologies by arguing that al-Kindī and al-Fārābī might have consulted different sources and thus reached different conclusions on this topic. However, we know that both had access to a common Aristotelian and Neoplatonic body of works that occasionally ascribed sensation to the heavenly bodies. Al-Fārābī would surely have come across this doctrine in some of the texts issuing from this corpus, such as *Theology of Aristotle*.[50] Rather, it seems more likely that he rejected celestial sensation as a result of the emphasis he places on the intellectual and rational nature of the orbs, through which he addresses more fundamental cosmological issues such as substance, existence, and motion. For al-Fārābī, the special kind of intellection the celestial souls possess is the key difference that sets them apart from other living beings.

Another salient feature of al-Fārābī's description of the celestial souls is his rejection of imagination (*takhayyul*) or the imaginative faculty (*al-quwwah al-mutakhayyilah*). Unlike al-Kindī and Ibn Sīnā, al-Fārābī limits the activity of the celestial souls to intellection alone and deprives them of the imaginative faculty. But in this case as well, he does not

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[48] Al-Fārābī (1999d, 46). But the ascription of this treatise to al-Fārābī remains to be confirmed by future research.

[49] For al-Kindī's view on this issue, see Wiesner (1993, 79 ff.); for a survey of this question in the Greek and early Arabic background, see Wolfson (1962) and Walzer (in al-Fārābī 1985a, 366). This argument has its roots in ancient Greek thought, and some thinkers such as Plutarch of Chaeronea also ascribed hearing and sight to the heavenly bodies on these grounds; see Wolfson (1962, 77–79).

[50] Badawī (1977b, 101 ff.) and Lewis (1959, 75–79).

adduce arguments to defend his position. This is all the more surprising, when one realizes the important role that imagination plays in al-Fārābī's political and psychological theories. One reason could lie in his belief that imagination replaces reason in the non-rational animals.[51] Since the planets are rational beings, they do not need imagination to reach their state of perfection.

In brief, the celestial souls possess the rational faculty only and have neither sensation nor imagination, which are confined to the sublunary animals. But what al-Fārābī has to say concerning the rationality of the celestial souls is relatively limited. Indeed, he says virtually nothing about will (*irādah*), choice (*ikhtiyār*), and desire (*shawq*, *tashawwuq*), concepts that are often associated with the rational activity of the orbs, and which furthermore played a key role in medieval Arabic accounts of heavenly motion inspired by Aristotelian cosmology. According to this theory, the celestial souls seek the perfections of the immaterial movers out of will and desire, and as a result produce the circular motion of the heavens. Al-Kindī, al-Sijistānī, and later on Ibn Sīnā, for instance, endow the celestial bodies with will (*irādah*) and make it a cornerstone of their cosmology.[52] This concept was also adopted by al-Biṭrūjī and Ibn Rushd in the Western Islamic lands and seems to have been prevalent in the Arabic Peripatetic tradition. It is therefore surprising to realize that al-Fārābī omits to mention it in his works.[53] A possible explanation is that he considered will proper to the human soul and unnecessary to explicate heavenly motion.[54] One may nonetheless assume that the celestial bodies possess will by virtue of their very rationality. Since they have reason, they must possess choice (*ikhtiyār*) and will (*irādah*) as well. This point should be borne in mind when analyzing the Second Teacher's theory of celestial motion, which will be taken up in chapter 4.

The foregoing comments underscore al-Fārābī's belief in the exclusively intellectual nature of the celestial souls: they possess rational thought alone and are deprived of sensation and imagination. It is,

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[51] Al-Fārābī (1964, 33).

[52] Walzer (1957, 230), Ibn Sīnā (1983–86, 383, 11–13, 391, 10), al-Sijistānī (1974a, 370 and 1974b, 374–375).

[53] For al-Biṭrūjī, see Samso (1992, 8 ff.); and for Ibn Rushd, Carmody (1952, 580–581).

[54] For example, in *Falsafat Aristūṭālīs* (al-Fārābī 2001c, 129) he writes about "the acts generated from will, volition, and choice" that "it is these that make up the *human* will [*al-irādah al-insāniyyah*]."

however, regrettable that he does not provide more detailed information about these celestial souls and that he leaves several questions unanswered. Are both the orbs and planets ensouled or are the planets or orbs alone ensouled? How many souls does each planetary system or group possess? Although al-Fārābī does not address these issues in any depth in his extant works, it may be argued on the basis of certain passages that he held both the orbs and planets to be ensouled. First, this may be inferred from the fact that the outermost orb, in spite of being starless and planetless, is placed in the same category of ensouled celestial bodies as the planetary orbs.[55] Second, since all the heavenly bodies have a form that inheres in a substrate, and since al-Fārābī equates their form with their soul, it would seem that all of them must therefore have a soul. Yet the issue of the ensoulment of the orbs and planets creates certain tensions when it is connected with al-Fārābī's views on celestial kinematics, as will be shown in chapter 4.

1.3.1. *Celestial Soul and Nature*

Al-Fārābī's views on the celestial soul and its co-existence with the celestial body also raise the question of how these principles relate to the concept of nature, an important and much debated question in late antique cosmology. Two issues worth investigating in this connection are what kind of nature (*ṭabīʿah*) the heavens possess and how this celestial nature fits in the broader concept of nature in al-Fārābī's philosophy. The Second Teacher was aware of the fact that Aristotle had reflected on this cosmological question, as he writes that the Stagirite "had to investigate also whether the substances of the heavenly bodies consist of a nature [*ṭabīʿah*] or a soul or an intellect."[56] The Peripatetic tradition that developed subsequent to Aristotle weaved a rich and diverse body of answers to the question of heavenly nature, thus producing its own elaborations and accretions on the Stagirite's ideas.[57] Some of the interpretive strategies adopted in the late antique commentatorial tradition included equating nature with the celestial souls or, conversely, with the special material constitution of the heavens.

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[55] Al-Fārābī (1985a, 118–123 and 1985b, 69–71).

[56] Al-Fārābī (2001c, 129).

[57] Notably on *On the Heavens* 1.2-4, *Physics* 2.1, and *Metaphysics* 5.4. Aristotle also mentions the "nature of the stars" at *Metaphysics* 12.8.1073a34. The loss of al-Fārābī's commentaries on the first two of these works is particularly problematic when treating such questions as the heavenly nature.

Since Aristotle had defined nature as an internal source of motion in a body,[58] the challenge was to explain whether this source was psychological or merely material and how this definition could be meaningfully applied to the celestial entities, which appeared to be different from other bodies in many respects, including their circular motion.

In addition, it was unclear how this natural celestial motion could simultaneously be caused by other, non-physical principles such as the unmoved movers. As a result of the apparent contradictions in the Aristotelian corpus on this issue,[59] and depending on the exegete, the concept of celestial nature was interpreted in connection with the special celestial element (aether or a refined kind of fire), the celestial soul, or an inclination in the celestial bodies. An example of this kind of exegetical enterprise can be found in Simplicius' commentary on *Physics*, which defines celestial nature in light of the special material constitution of the orbs and their inclination for celestial motion. At the same time, he clearly distinguishes nature from soul and criticizes Alexander for conflating the two concepts.[60]

It is against this exegetical background that al-Fārābī's views on the celestial nature should be examined. He follows Aristotle closely in his general definition of nature, particularly *Physics* 2.1 and *Metaphysics* 5.4. Like Aristotle, he holds the view that "the term nature applies to both matter and form," although "form is more appropriately called by this name."[61] In *Falsafat Arisṭūṭālīs*, he explains that nature refers primarily to the essence of a composite being, thus reformulating *Metaphysics* 5.4.1014b35-37.[62] In addition, al-Fārābī also refers to the Aristotelian definition of nature as a "principle of motion and rest."[63] Finally, natural bodies are described in *Iḥṣāʾ* as bodies produced neither by art nor human volition and thus in a sense primary. "The simple natural bodies," al-Fārābī writes "are those the existence of which does not result from bodies other than themselves,"[64] and he specifically mentions the heavens (*samāʾ*) as an example of a natural

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[58] As in *Physics* 2.1.192b23-24 and *Metaphysics* 5.4.1014b19-21.

[59] In *On the Heavens* 1.2-4 Aristotle explains celestial motion through aether's natural tendency to move in circles, but in section 2.2 of the same work he seems to make soul responsible for causing this same motion.

[60] See the various excerpts collected in Sorabji (2005, vol. 2, 49–53).

[61] Al-Fārābī (1964, 36) translated in Alon (2002, 655).

[62] Al-Fārābī (1961a, 89,11–16 and 114,15–22).

[63] Al-Fārābī (1999a, sec. 13, 60) and Alon (2002, 655); but as will be shown in appendix 1, *ʿUyūn* is probably not authentic.

[64] Al-Fārābī (1949, 83, 8).

body.[65] If we follow al-Fārābī on this question, then bodies can be said to be 'natural' in several ways: a) because they are endowed with a principle of motion and rest; b) because they have form; c) because they have matter; d) because they are compound substances made of form and matter; e) because they are primary entities not produced by artificial or artistic means. All of these definitions apply somewhat to the celestial bodies. Indeed, al-Fārābī regards them as composite (they are made of substrate and soul-form), they are endowed with a principle of motion (albeit not of rest), and they are not artificial, in the sense that they are not produced by art or human volition. By their very virtue of being bodies (*ajsām*), they necessarily form part of the realm of nature or what al-Fārābī calls "the world" (*al-ʿālam*).[66] Broadly speaking, then, al-Fārābī defines the realm of nature as encompassing both the sublunary world and the physical heavens.

Although the above taxonomy is useful to understand in what sense the heavens are 'a part of nature,' it sheds little light on the possible existence of a special heavenly nature. This difficulty is further compounded by the fact that al-Fārābī mentions the term 'nature' only a few times in a heavenly context: once in *Siyāsah*, where he explains that it is in the nature (*ṭabīʿah*) of the celestial bodies to act on the sublunary world; and twice in *Ārāʾ* in connection with celestial motion, where al-Fārābī explains that the heavenly bodies move "by nature" (*bi-ṭabīʿatihā*) and through a "common nature" (*ṭabīʿah mushtarakah*).[67] These statements can be globally interpreted in light of *Physics* 2.1.192b35 ff. as meaning that the heavens possess certain qualities, especially luminosity and circular motion,[68] "by nature" or "according to nature," in the sense that these qualities do not come about through compulsion or are opposed to the celestial inclination and substance.

With respect to the first occurrence, however, it may be worthwhile comparing al-Fārābī's idea of a celestial nature acting on the sublunary world to Alexander's cosmology. Alexander not only conceived of the entire heaven as having a nature, but he also described the powers it produced and transmitted to the world of generation and corruption as

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[65] Al-Fārābī (1949, 91); the corresponding passage seems to be *Physics* 2.1.192b12-20.

[66] Al-Fārābī (2001c, 20).

[67] Al-Fārābī (1964, 55–56, 1985a, 104–105, 132–133, and 1985b, 62, 75).

[68] Al-Fārābī (1964, 55).

an extension of the heavenly nature.[69] Al-Fārābī, probably following Alexander, also presents the celestial bodies as transmitting powers to the sublunary world as a result of their special nature. In the passage of *Siyāsah* mentioned above, he argues that the heavenly bodies possess powers (*quwan*) that act on the sublunary world, in a manner which recalls Alexander's own theory of celestial powers, and he even makes the celestial nature responsible for the generation of prime matter: "The substance, nature [*ṭabīʿah*], and activity of the celestial body is such that there immediately follows from it the existence of prime matter."[70] In that sense, al-Fārābī follows Alexander in establishing a connection between the heavenly nature and power and the sublunary processes of generation and corruption.

But to which cosmological principle should this special celestial nature be connected? Alexander and al-Fārābī both elevate the heavenly bodies to a high status in their ontology, the former describing them as "divine" (probably following Aristotle in *Metaphysics* 12.8.1074b ff. and *On the Heavens* 1.3.270b ff.), the latter connecting them with the causality of the separate intellects and equating each one of them with an angel.[71] These views in turn rest on the premise of the ensoulment of the heavens, which is fundamental in these two philosophers' cosmologies. In the case of Alexander, the celestial 'nature' can be directly connected with the celestial soul, which is responsible for causing the motions that in turn produce the powers emanating on the world of generation and corruption. Indeed, we know from Simplicius' account in *On the Heavens* and from his commentary on *Physics*[72] that Alexander equated the celestial soul with the celestial nature. In *Mabādiʾ*, it is stated explicitly that "the nature of these things [i.e., the celestial bodies] is the soul."[73] It is perhaps partly as a result of the influence of the *Alexander arabus* that al-Fārābī chose to define the celestial substance primarily in light of the soul and its psychological

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[69] This view is articulated in *Mantissa* and *Quaestiones*; see the fragments collected in Sorabji (2005, vol. 2, 41). It should be noted, however, that the ascription of these works to Alexander has been contested. As for *Mabādiʾ*, the more likely vector of transmission for these ideas, see Alexander (2001, 113), where he explains that the processes of generation and corruption are due to the power (*quwwah*) of the celestial bodies. He writes: "This [celestial] nature and power are the cause of the unity and order of the world."

[70] Al-Fārābī (1964, 55).

[71] As Sorabji (2005, vol. 2, 40) explains, for Alexander, nature is "a divine power, because derived from the heavenly bodies which are divine"; al-Fārābī (1964, 32).

[72] The relevant passage (1219,1–7) is reproduced in Sorabji (2005, vol. 2, 49).

[73] Alexander (2001, 94–95).

faculties in his cosmological treatises, *Ārāʾ* and *Siyāsah*. In these works, al-Fārābī never equates celestial nature with matter—even a special kind of celestial matter—as Aristotle does in *On the Heavens* 1.2, but rather presents soul as the main principle of the celestial substance. Like Alexander, then, al-Fārābī probably considered the celestial nature to be psychological and in fact reducible to soul. The dual ideas of the ensoulment of the heavens and of a heavenly nature that acts directly on the sublunary world appear side by side in their works. These parallels suggest a link between the two thinkers with regard to the conceptualization of celestial soul and nature.[74]

1.3.2. *The Contemplation and Knowledge of the Celestial Souls*

As mentioned previously, the celestial souls are characterized primarily by their rationality and abstract thinking. But their contemplation is by no means a perfectly simple act, since it is oriented toward various different objects. According to al-Fārābī, the souls of the heavenly bodies focus on three objects of thought, two of which are exterior to their essence. First and foremost, they reflect upon God as the ultimate principle of the universe and as the most perfect being. Second, each one of them contemplates the separate intellect responsible for its existence, which is its proximate efficient and final cause. Finally, each heavenly soul contemplates its own essence (*dhātahā*).[75]

This threefold mode of intellection introduces a notion of multiplicity (*kathrah*) in the heavenly souls and prevents them from being completely simple substances. Al-Fārābī, following Aristotle, equates thought and the object of thought in the divine essence.[76] In the case of the celestial bodies, however, the relation between the intellect and the intelligible is different for two reasons. First, because the heavenly bodies are not thinking one object, but three different objects simultaneously. Second, because they contemplate objects that are exterior to

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[74] There seems to be a significant difference in their use of the term nature, however. Whereas Alexander limits nature to soul, al-Fārābī (1964, 55) goes further and even speaks of the nature of the Agent Intellect. "The Agent Intellect," he writes, "is disposed in its nature [*bi-ṭabīʿatihī*] and substance to examine everything that the celestial body prepares and gives." This mention of a nature in connection with an intellectual principle is quite surprising and seems incongruous, since the Agent Intellect is removed from all materiality and the perceptible world.

[75] Al-Fārābī (1985a, 122–123, 1985b, 70, and 1964, 34).

[76] Al-Fārābī (1985a, 70–73 and 1985b, 46–47), which echoes certain passages of *Metaphysics* 12.9; more on this later on.

and separate from their own essence, namely, the First Cause and the separate intellects.

Al-Fārābī's theory of the threefold intellection of the heavenly souls represents an interesting and idiosyncratic feature of his cosmology. It plays a key role in explaining not only the motion of the orbs and their impact on sublunary phenomena, but also the status of the heavenly bodies as intermediate beings between the more perfect separate intellects and the sublunary world. But how did al-Fārābī come up with this theory? In what follows I will argue that it represents an original elaboration on al-Fārābī's part, which was nevertheless inspired by his reading of the *Proclus arabus* texts.

To begin with, one finds in Proclus the idea that the souls and intellects are intimately connected, that is, that the celestial souls derive from the intellects, and thus that in a certain way these souls participate in the nature of intellect. This view is articulated, for instance, in Propositions 174, 193, 207, and 208 of *Elements*. The parallel is further strengthened by the fact that in *Elements* some of these souls are meant to inhere in corporeal bodies, by which Proclus means the planets. As Proposition 196 states, "every participated soul makes use of a first body which is perpetual."[77] Moreover, Proposition 201 of *Elements* explains that each soul is characterized by a "threefold activity" (τριπλᾶς ἐνεργείας), which reflects its intermediary status between the intelligible and corporeal worlds. This threefold activity of the souls is due to their godlike nature, to their intellectual nature, and to their having self-motion. Al-Fārābī does not reproduce this exact scheme in his treatises, but it is likely that he derived the idea of the three-fold intellection of the celestial souls from an Arabic adaptation of this passage.

A likely vehicle of transmission for this last theory is *Maḥḍ al-khayr*. In Proposition 3 of this work, the Arabic adaptor discusses the nature of soul and says: "Every noble soul possesses three actions [or operations] [*afāʿīl*]: a spiritual or psychological [*nafsānī*] action, an intellectual [ʿ*aqlī*] action, and a divine [*ilāhī*] action."[78] The adaptor goes on to explain that these actions are made possible by powers [*quwan*] invested in the Soul by the First Cause and the Intellect. It is through these powers that the Soul can act on the world of nature and acquire knowledge.

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[77] Proclus (1963, 196, 18–19).
[78] Badawī (1977a, 5, my translation).

At the end of this proposition, the author provides a similar statement about the threefold power in the soul: "soul has three actions [*afāʿīl*] because it has three powers [*quwan*]: a divine power, an intellectual power, and an essential power [*quwwah dhātiyyah*]."[79] What is of interest in addition to *quwwah*—a key concept of classical *falsafah*, but which is to be understood in this case in the sense of 'power,' not 'potentiality' or 'possibility'—is the idea that soul is divided into three aspects, one connected with the First Cause (*ilāhī*), one with Intellect (*ʿaqlī*), and one with its own essence (*nafsāniyyah* or *dhātiyyah*). *Maḥḍ al-khayr*'s division of the soul into these three different aspects corresponds in al-Fārābī's cosmology to the souls' three objects of thought: the First, the separate intellects, and their own essence. This passage shows such striking resemblance to al-Fārābī's theory that there can be little doubt that it represents its point of origin.

Due to their intellectual nature, the celestial souls are characterized first and foremost by their having knowledge (*ʿilm*) and by being in a perpetual state of reflection. But is their knowledge restricted to the higher principles or does it include the particulars of the sublunary world as well? Put differently, can these souls know what lies beneath them, either as a result of knowing their own essence or in their capacity as causes of these things? And is their intellection discursive or nondiscursive? Al-Fārābī describes the celestial souls as being in a state of continuous intellectual activity or contemplation. They are "always contemplating what they contemplate," and the "objects of their intellects are present in them from the very beginning." This means that these souls are always in a state of actuality. This idea is emphasized when he writes that the heavenly souls are "never potential" (*wa-dhālika annahā lam takun bi-l-quwwah aṣlan*) and "always [or eternally] actual" (*bal hiya bi-l-fiʿl dāʾiman*).[80] The intelligibles in them are continuously actualized and have been so "from the very start" (*min awwal al-amr*). This equation between intellection and actuality harkens back to Aristotle's account of God as *nous* and pure actuality in Book Lambda 7 and 9, and it is clear that al-Fārābī is following a well-established tradition. But what is notable here is that al-Fārābī applies this principle to the heavenly souls, thereby underlining their intellectual nature in spite of their defects as substances.

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[79] Badawī (1977a, 6, my translation).
[80] Al-Fārābī (1964, 34).

Al-Fārābī also compares the heavenly and human souls. Unlike the former, the latter "are at first in potentiality and then later in actuality."[81] In the case of human intellection, which is discursive and moves from one object to another, it is clear that the intellect apprehends only one particular object at any given time, because it cannot think many objects simultaneously. However, the celestial souls in contrast contemplate several objects simultaneously, and these objects, namely, God and the separate intellects, are themselves eternal and unchanging. Clearly, then, for al-Fārābī, the intellection of the celestial souls is continuous, simultaneous, and non-discursive.

As for the question of the heavenly souls' knowledge of particulars, it was occasionally broached in late antique works and is intricately linked to the theme of divine providence (*ʿināyah*). A salient example of this type of cosmological discussion is the Arabic translation of Alexander's *De providentia*, which examines the questions of celestial knowledge and providence at length. This trend continued in the early Arabic context, partly as a result of the influence of the *Alexander arabus*, as can be seen in the works of al-Kindī as well as those of early Arabic astrologers such as Abū Maʿshar.[82] Al-Fārābī, in comparison, says little about this issue, but what he does say seems to exclude the possibility of the souls' knowledge of particulars. Most of the relevant information can be found in a short section of *Siyāsah*.[83] There one reads that "the celestial souls definitely do not contemplate the majority of the intelligibles that humans contemplate from things in matter, because they are far too high in rank by virtue of their substance to contemplate the intelligibles that are below them." This statement seems to limit the intelligibles of the celestial souls to eternal, immaterial principles, a view that agrees fully with al-Fārābī's belief that the souls are always in actuality "due to the fact that the objects of their intellect are present in them from the very beginning [*min awwal al-amr*]." Indeed, if the heavenly souls knew particulars, their thought would be discursive and constantly changing from one object to another. Alternatively, the heavenly bodies could know particulars in a

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[81] Al-Fārābī (1964, 34) and McGinnis and Reisman (2007, 83, translations slightly revised).

[82] For the influence of the *Alexander arabus* in this respect, see Alexander (2003), Wiesner (1993, 41–107) and Fazzo and Wiesner (1993). For al-Kindī and Abū Maʿshar, see Adamson (2002b) and Burnett (2002).

[83] Al-Fārābī (1964, 34).

universal way, but al-Fārābī says nothing that could be used in support of this view.[84]

The previous comparison between the *Proclus arabus* and al-Fārābī's writings convincingly shows that the Second Teacher adapted Neoplatonic theories on soul and intellect and reconciled them with other aspects of his cosmology. Regardless of the recension in which al-Fārābī read the *Proclus arabus*, this corpus, especially Proposition 3 of *Maḥḍ al-khayr* and the Arabic version of Proposition 201 of *Elements*, represents one of the key sources underlying his theories of celestial psychology.

Before concluding this section, I wish to highlight certain tensions in al-Fārābī's account of the celestial souls. The first one is al-Fārābī's claim that the celestial souls are essentially intellects, since they have neither sense perception nor imagination, but only the rational faculty. But if this is the case, it becomes difficult to understand how they may be said to inhere in any kind of substrate, since what is intellectual is by definition immaterial and does not need a substrate to exist. Yet these soul-intellects are said to inhere in celestial substrates, which are even compared to the material substrates of sublunary beings. A second tension concerns the celestial souls' self-contemplation and their knowledge of "their own essence," as al-Fārābī puts it. Al-Fārābī does not elaborate at all on this point, which leaves the reader quite perplexed about what exactly is meant by "their own essence." Did he intend to refer only to the rational part of the celestial essence, in which case the self-reflexivity of the souls would focus on their very act of thinking? But this could lead to a circular argument, as their thinking about their own essence could be reducible to their thinking about the higher principles. Or did al-Fārābī intend to say that the celestial souls think of themselves not only *qua* thinking subjects, but rather as composite and caused entities, a definition which would include their substrate as well, as is suggested in one passage of *Ārāʾ*?[85] According to this interpretation, the celestial souls would apprehend their essence as being

[84] On this issue, as on many other specific cosmological points, Ibn Sīnā departed from his predecessor and ascribed knowledge of past, present, and future particulars to the celestial souls. This seems a direct corollary of Ibn Sīnā's ascription of the faculty of imagination to these souls. On this point and its implications for human knowledge, see Gutas (2006a, 360–363).

[85] Al-Fārābī (1985a, 122–123 and 1985b, 70): "but the entirety of what it [the celestial soul] thinks of its essence is not intellect, because it [also] thinks its substrate [*mawḍūʿ*]."

composite and causally derivative in a manner comparable to Ibn Sīnā's notion of the 'possible of existence.'

Finally, there is the question of what distinguishes the soul's contemplation of the First and of the specific separate intellect that caused it to exist, since both objects are immaterial and intellectual and therefore cannot be individualized by resorting to the concept of matter. These tensions, which can definitely be seen as shortcomings in al-Fārābī's account, insofar as he does not explain them adequately, most likely arose out of his practice of adapting particular theories from *Proclus arabus*. While these theories acquired a new meaning and function in the context of his cosmology, they were at the same time fraught with theoretical difficulties, which had puzzled the Greek Neoplatonists for centuries, and which al-Fārābī's highly synthetic approach could not address in detail.

2. *The Separate Intellects*

2.1. *The Origin of al-Fārābī's Ennadic Scheme*

Distinct from and above the souls in the ontological hierarchy is a second class of intellects, which al-Fārābī calls the "separate intellects" (*al-ʿuqūl al-mufāriqah*, or simply *al-mufāriqah*) to express the fact that, unlike the celestial souls, they do not inhere in any substrate and are immaterial beings. These separate intellects constitute a vertical line of existents that act as an intermediary between the First and the corporeal world consisting of the heavens and the sublunary realm. They are ten in number and possess a common immaterial and intellectual nature. This means that they can be apprehended neither in relation to matter nor to time, which they transcend. Rather, their conceptual organization or hierarchy is defined in terms of essential priority and posteriority.[86] In spite of their identical intellectual nature, these entities

[86] As these purely immaterial beings are beyond or outside of time, they do not have a temporal relation to other entities. Consequently, the relation between them can only be defined according to the concepts of 'prior' and 'posterior.' In his logical treatises *Al-fuṣūl al-khamsah* and *K. al-maqūlāt* (al-Fārābī 1985c, vol. 1, 66,9 ff. and 129 ff.), al-Fārābī identifies five senses in which the 'prior' and 'posterior' may be predicated of a thing: according to time, to nature, to rank, to nobleness, and to being a cause of something else. It is interesting, if somewhat challenging, to attempt to apply this classification to al-Fārābī's metaphysics. As we saw above, the notion of time should definitely be excluded, since the immaterial beings do not have a temporal subsistence. As for the other notions, a separate intellect may be said to be prior to another intellect

may in turn be divided into two categories. Al-Fārābī calls the first nine separate intellects *al-thawānī*, while the last and tenth separate intellect is described as the Agent Intellect (*al-ʿaql al-faʿʿāl*).[87] In most cases, al-Fārābī maintains a terminological and conceptual distinction between these intellects and discusses them in separate parts of his works. This distinction has not been sufficiently emphasized in the modern literature, and the general tendency has been to treat the *thawānī* and the Agent Intellect as belonging to a single group of existents. Yet as we shall see, they present different characteristics and fulfill different functions.

The term *thawānī* itself is interesting and deserves some attention. It may refer to the intermediate position that these intellects occupy between God and the corporeal world. They are, literally, the "second" in rank after God, called the First. But their name also refers to the fact that they are secondary causes of existence, since they produce the celestial bodies as a result of their own intellection. Ultimately, God is the primary agent and First Cause responsible for the causation of the entire world, and the *thawānī* are the proximate efficient causes of the heavens. Finally, the term *thawānī* may also refer to the twofold intellection and causation of the separate intellects (i.e., their contemplation of the First and of their own essence, which results in the causation of another intellect and an orb together with its soul). It is intriguing that the term *al-thawānī* appears in *Maḥḍ al-khayr*, the Arabic adaptation of Proclus' *Elements*, where, as in al-Fārābī's works, it refers to celestial

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according to the following senses: a) by being a cause of its existence. This is perhaps the most obvious sense of prior with regard to the separate intellects, as they are the causes of existence of lower beings. This causality should not be understood temporally, but rather in terms of logical entailment and necessary simultaneity, such as the synchronous movement of a hand and a doorknob when a door opens or the rising of the sun and the emission of its light; b) by being nobler in substance than the lower beings. This goes hand in hand with the intellects being causes of other beings, a cause always being nobler than its effect; and c) by being higher in ontological rank, which is a corollary of the two previous propositions concerning the priority of a cause over its effect. Finally, with regard to the ambiguous expression 'prior by nature,' al-Fārābī provides two examples to illustrate what he means: the natural priority of 'one' over the number 'two,' and the natural priority of the concept and definition of animal over that of human. Following this line of reasoning, it would seem that the separate intellects can also be said to be prior by nature, for their existence precedes that of the lower existents according to the structure of reality and the *ordo essendi*. In other words, if one were to eliminate the separate intellects, then the effects below them would not exist, just as if the concept 'one' were to be eliminated, then the numbers following it would not exist either.

[87] Al-Fārābī (1964, 31).

intellects (*ʿuqūl*).[88] This terminological parallel is not sufficient to prove that al-Fārābī consulted this source, but the many other similarities existing between *Maḥḍ al-khayr* and al-Fārābī's theories of celestial intellection support this hypothesis. In any case, these separate intellects form a distinct set of immaterial existents in the ontological chain that begins with the First and ends with prime matter, "the lowest of the possibly existing things."[89] Finally, it should be noted that in his extant works, al-Fārābī, unlike Ibn Sīnā, does not offer any proof concerning the existence of the separate intellects or any justification concerning their number.[90]

In total, then, there are nine *thawānī*, which correspond to the nine main celestial orbs of al-Fārābī's cosmology, as well as one Agent Intellect, which does not correspond to a celestial orb, but whose task is to govern the sublunary world. Although al-Fārābī's cosmology has been called "decadic" (due to the existence of ten separate intellects after the First),[91] it would be more precise to call it an 'ennadic' system, because there are nine main celestial orbs and nine *thawānī*, and because this symmetry breaks down with the Agent Intellect. The idea of an ennadic system is also reinforced by the differences that distinguish the *thawānī* from the Agent Intellect.

This multiplicity of souls and intellects at the superlunary level reminds one of the metaphysical models of some Neoplatonic thinkers such as Proclus, while al-Fārābī's hierarchy of the First, separate intellects, and celestial souls corresponds essentially (although not numerically) to the triad of One, Intellect, and Soul that can be found in the metaphysics of Plotinus (d. 270 CE). These Neoplatonic metaphysical features can be found in the *Neoplatonica arabica*, including the Arabic corpus that emerged from Proclus' *Elements*, i.e., *Maḥḍ al-khayr*. In spite of these obvious Neoplatonic parallels, however, al-Fārābī's distinction between the separate intellects and celestial souls and his conception of how these entities relate to the celestial bodies likely stems

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[88] See Badawī (1977a, 7,8), where there is mention of *al-ʿuqūl al-thawānī*. In *Maḥḍ al-khayr*, this formula also refers to separate intellects, but these do not fulfill the same role as in al-Fārābī's cosmology.

[89] Al-Fārābī (1964, 58).

[90] Ibn Sīnā is aware of the need to justify the existence of the unmoved movers, and he devotes several sections of his metaphysical treatises to this effect, as in *Najāh* (Ibn Sīnā 1985, 314–316), *Ilāhiyyāt* of *Shifāʾ* (id. 1983–86, 393,5), and *Ishārāt* (id. 1951, 402/160 ff.).

[91] Maróth (1995).

from a particular interpretation of Aristotle's *Metaphysics* Book Lambda 7 and 8. This work posits a first entity at the very top of the celestial hierarchy (the First Unmoved Mover), other lower unmoved movers, and the celestial bodies, which are presumably ensouled. This hypothesis seems reasonable, especially given al-Fārābī's thorough knowledge of Book Lambda, and in spite of the fact that the distinction in *Metaphysics* between the separate movers, the orbs, and the celestial souls is not clear and has puzzled ancient, medieval, and modern scholars alike.[92]

The key question at this point is how al-Fārābī interpreted the cosmology of *Metaphysics* Book Lambda, especially with regard to Aristotle's doctrine of the unmoved movers. More specifically, how did al-Fārābī understand the issues of whether these movers are separate from the orbs, of their number, and of their activity? What are the features of his cosmological theory that can be traced to the Arabic versions of Book Lambda, and what are those which in contrast may have derived from other sources or were elaborated by al-Fārābī himself?[93]

Perhaps the most pressing question in this respect pertains to the philosophical sources underlying al-Fārābī's division of the cosmos into nine major orbs, to which correspond nine separate intellects, since this doctrine is not found in this form in Aristotle's works. Because the structure of al-Fārābī's cosmology conforms to the nine-tiered universe of Ptolemy and most Arabic astronomers, it is reasonable to think, as R. Walzer and D. De Smet have, that al-Fārābī took purely astronomical considerations into account when elaborating his

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[92] Indeed, Aristotle's description of these various beings in this work is obscure and has given rise to many different interpretations. It is beyond the scope of this book to analyze this question in detail and to provide a survey of the Aristotelian scholarship on it. For more information, I refer the reader to some classic studies: Merlan (1946), Owens (1950, who provides an overview of the debate before 1950), Wolfson (1958 and 1962), Broadie (1993), Kosman (1994), Gill (1994), and Beere (2003). What is of interest here is not what Aristotle's original cosmological ideas were like, but how al-Fārābī may have interpreted the *Aristoteles arabus* and used it as a model for his own cosmology.

[93] The problem in a sense is to address how al-Fārābī interpreted Aristotle at *Metaphysics* 3.1.995b.31–34, when he writes that "we must inquire and discuss especially whether there is, besides the matter, any thing that is a cause in itself or not, and whether this can exist apart or not, and whether it is one or more in number." Indeed, one of the key issues of Arabic cosmology seems to have revolved around the question of how Arabic philosophers interpreted the immovable substances posited by the Stagirite.

system.[94] But even if this assumption is true, one still has to explain how al-Fārābī managed to reconcile Aristotle's unmoved movers with this new astronomical model. Moreover, it does not account for the special nature and activity that characterize the separate intellects, which depart from Aristotle and bear no apparent connection with the Greek and Arabic astronomical traditions. Finally, this assumption runs into a problem related to celestial motion that has not been hitherto fully addressed and which will be discussed in detail later on.

In the following section, I will examine these questions with the aim of illuminating al-Fārābī's doctrine of the nine separate intellects. Special attention will be devoted to the Arabic versions of Book Lambda and some late antique commentaries on this work. This analysis seems highly desirable, because al-Fārābī's theory of the separate intellects appears at first glance to be without precedents in the Arabic tradition. Indeed, he is the first Arabic thinker to clearly posit an intermediate level of intellectual beings between God and the material heavens.[95] What is more, the number of intellects he adopts also seems unprecedented in Greek philosophy, which otherwise provides the closest parallels to his model. Although several valuable contributions have already discussed some of the sources that influenced al-Fārābī, no systematic and comparative analysis of these texts, especially in their Arabic translations and adaptations, has been conducted, which would enable a thorough reconstruction of the Second Teacher's interpretation of ancient Greek cosmology.[96]

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[94] Walzer (in al-Fārābī 1985a, 365–366) and De Smet (1995, 275–276, 284).

[95] The evidence for the existence of these intellects in al-Kindī's philosophy is highly ambiguous; see Adamson (2007a, 60). Since al-Kindī, unlike al-Fārābī, equates eternity and the state of uncausedness (Adamson 2007a, 99–102), God is the sole existent in his system that can truly be said to be eternal. This would seem to exclude the existence of separate intellects that are eternal, but caused, as in al-Fārābī's metaphysics. At any rate, one does not find an explicit and detailed articulation of the separate intellects in al-Kindī's works.

[96] See notably the study in Russian by Demidčik (1975), Walzer (in al-Fārābī 1985a), Maróth (1994 and 1995), De Smet (1995, 272–284), Genequand ("Introduction" in Alexander 2001), and Daiber (2004) for insight into al-Fārābī's use of Book Lambda and some late antique texts. In his commentary on *Ārāʾ*, Walzer hypothesized that al-Fārābī based his cosmological model on a nonextant Neoplatonic source, which would have provided him with an already-made cosmological and metaphysical synthesis (al-Fārābī 1985a, 363, 365). However, because Walzer was unable to identify this putative source, his view has been rightly criticized (cf. Mahdi 1990a). As the following discussion will show, many extant sources from late antiquity can shed valuable light on the structure of al-Fārābī's theory of the orbs and intellects.

2.1.1. *Al-Fārābī and the Arabic Versions of Book Lambda on the Unmoved Movers*

An obvious place to begin the inquiry is in Aristotle's Book Lambda, which would have been known to al-Fārābī in at least two different Arabic translations. The most important questions in this respect are the following: to what extent is al-Fārābī's hierarchy of the First, the separate intellects, and the celestial souls, to which correspond the nine main celestial orbs, derived from Book Lambda and its commentaries? Alternatively, what role did late antique Peripatetic and Neoplatonic texts play in shaping his interpretation of this foundational work? Both hypotheses present difficulties. In the case of Book Lambda, one must show that al-Fārābī construed it in a way that resembles his own cosmological scheme.[97] In positing other, Neoplatonic sources, a new problem arises: these primarily discuss Intellect and Soul as hypostatic or universal ontological entities, not as particular souls and intellects inhering in the heavenly orbs, so that the transition from this Neoplatonic framework to al-Fārābī's cosmology is neither logical nor obvious and has to be accounted for.

Thanks notably to the recent works of P. Thillet and A. Bertolacci, we have a much clearer picture today of the reception of Aristotle's *Metaphysics* in the Arabic world.[98] The results of their research show that thinkers active during al-Fārābī's time had access to several translations of Book Lambda: one by Usṭāth, one by Mattā ibn Yūnus, which also contained an incomplete commentary by Alexander of Aphrodisias, and one (possibly) by Isḥāq ibn Ḥunayn. Only parts of the first two translations have survived. According to Bertolacci, a terminological comparison between the Arabic translations and al-Fārābī's corpus suggests that he probably used Usṭāth's version of Book Lambda, which is the oldest one.[99] Fortunately, this early translation is still partly extant in Ibn Rushd's *Tafsīr* on Book Lambda of *Metaphysics* together with a section of Mattā ibn Yūnus' translation.[100] In addition, al-Fārābī may

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[97] This, *a priori*, is far from certain. Ibn Rushd, for example, in his great commentary on the *Metaphysics*, Book Lambda, interprets Aristotle in a particular way by recognizing only the intellects that inhere in the spheres; see Genequand (in Ibn Rushd 1984b, 40–41).

[98] Thillet (2003), Bertolacci (2005b and 2006), and Geoffroy (2003).

[99] Bertolacci (2005b, 246, note 56). Ibn Sīnā also used this version; see Geoffroy (2003) and Janssens (2003).

[100] Ibn Rushd's *Tafsīr* was edited by Bouyges (1948); more recently Book Lambda has been translated in French by Martin (Ibn Rushd 1984c) and in English by

have consulted another version, which was edited by A. Badawī and which has often been called a 'Neoplatonizing adaptation,' because it inserts various elements not found in the original Greek and shows some similarity with *Theology of Aristotle*.[101]

An examination of Usṭāth's and Mattā ibn Yūnus' translations shows that although they introduce numerous small and not so small departures from the original Greek text, they convey a relatively accurate picture of Aristotle's cosmology as it appears in Book Lambda. For example, in textus 42, 43, and 44 of Ibn Rushd's *Tafsīr*, which contain Usṭāth's translation, one finds a discussion of the number of unmoved movers, which in textus 45, 46, and 47 are said to correspond to the number of celestial orbs and whose number is established at 47 or 55. A few passages in particular explicitly assert the Aristotelian theory of a plurality of unmoved movers: "then it is necessary that each one of these motions should be caused by something immovable by essence and an eternal substance"[102]; "It is clear that there must be as many substances as there are motions, that they are naturally eternal and immovable in themselves"[103]; "It must be considered, then, that the unmovable, and also the perceptible, principles, are this many [55 or 47]."[104] In addition, in textus 36 the question of the cause of celestial motion is addressed, and the theory that the Unmoved Mover acts as the first object of desire and thought is presented in a manner that mirrors Lambda 7. Finally, textus 51 defines the First Unmoved Mover as an intellect thinking itself. In spite of the linguistic gap and the hazards of textual transmission, then, Arabic thinkers had access through this translation to some of the most important features of Aristotle's cosmology.

In comparison to Usṭāth's version, the Arabic translation edited by A. Badawī differs quite significantly from the Greek original. Some of the essential features of Aristotle's doctrine in Book Lambda 7 and 8 nevertheless come through in the translation: the Unmoved Mover is

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Genequand (Ibn Rushd 1984b). I will be referring to Genequand's translation in my analysis. In this version, Abū Bishr Mattā's translation together with Alexander's commentary spans from textus 1 to 38 (from about 1069a18 to 1072b18 in the Greek text), at which point Usṭāth's translation takes over (textus 39 to 58). Most of the cosmological-astronomical aspects of Aristotle's account are therefore conveyed through Usṭāth's translation.

[101] Badawī (1947, 1–11).

[102] Ibn Rushd (1984b, 170, textus 43).

[103] Ibn Rushd (1984b, 170, textus 43).

[104] Ibn Rushd (1984b, 184, textus 48).

said to move the orbs only by way of being an object of desire and an object of thought (*wa-taḥrīkuhū innamā huwa ʿalā ṭarīq annahū maʿshūq wa-maʿqūl*).[105] The heavenly motions are 47 or 55, as are the "unmoved principles" responsible for the orbs' motions.[106] It is noteworthy, however, that the reference to the unmoved movers, described as "unmoved principles" (*mabādiʾ ghayr al-mutaḥarrikah*) in this translation, is much more fleeting and obscure than in the Usṭāth translation. In any case, both translations do mention "unmoved principles" or "unmoved movers."

This overview enables us to clarify an important point. If al-Fārābī had access to Usṭāth's translation—and the version given in Ibn Rushd's *Tafsīr* is the closest we can get to the text that al-Fārābī may have used—then he would certainly have concluded that Aristotle posited a series of unmoved movers, since this theory is explicitly asserted in this translation. Moreover, al-Fārābī *could* very well have regarded these movers as being separate from the orbs.[107] That he did in fact construe them as separate substances is confirmed *a posteriori* by the fact that he defines the separate intellects as movers (sing. *muḥarrik*) in his *Fī l-ʿaql*.[108] But this view is also implicitly conveyed in the Usṭāth translation. At textus 41, one reads that "there is a substance which is eternal, immovable and separate [*mufāriq*] from sensible things [i.e., the First Unmoved Mover]."[109] Shortly afterwards, in textus 42, the Arabic Aristotle raises

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[105] Badawī (1947, 5, my translation).

[106] Badawī (1947, 8). The passage immediately preceding the statement on the number of orbs is missing in the Arabic translation, as noted by Badawī. In this passage, Aristotle provides details about Eudoxus' and Callipus' theories and explains why many more orbs than planets must be posited in order to properly account for the planetary motions.

[107] The reason I stress the word 'could' is because Arabic thinkers developed divergent interpretations of this text. Ibn Rushd shows much hesitation in his various treatises, but in *Tafsīr* he seems to opt for only one separate unmoved mover, i.e., God, who is desired by the other intellects inhering in the celestial bodies; see Genequand ("Introduction" in Ibn Rushd 1984b, 40–41). As for Alexander, the evidence is ambiguous. Simplicius in his *On the Heavens* commentary (2004b, 269, 30-270, 27) criticizes Alexander for positing only one separate unmoved mover, a fact noted by Sorabji in his preface to the same volume (viii). Genequand (Ibn Rushd 1984b, 41) comes to the same conclusion and makes *Mabādiʾ* a precedent for Ibn Rushd's position, but Sharples (2003, 198–199) believes that the Greek works of Alexander maintained the existence of several unmoved movers. Upon closer examination, however, the passages from Alexander's commentary on *Metaphysics* adduced by Sharples to prove this point seem to me to be very ambiguous. The question of the number of the separate unmoved movers in the Greek and Arabic Alexander deserves a detailed study.

[108] Al-Fārābī (1938, 34) and McGinnis and Reisman (2007, 77).

[109] Ibn Rushd (1984b, 162).

the question of whether "we should posit one such substance or more," the separability of these substances being assumed, and concludes that there are 47 or 55 movers.[110] Hence, in addition to the postulate of the existence of *several* unmoved movers, al-Fārābī may have naturally concluded from the Arabic Book Lambda that these movers are *separate* from the orbs.

However, contrasting evidence from al-Fārābī's works may be adduced against this hypothesis. In some of his other works on Aristotle, al-Fārābī only mentions one unmoved mover. For example, in *Falsafat Arisṭūṭālīs*, al-Fārābī writes that

> he [Aristotle] investigated whether or not the principles that move the bodies moving in a circular motion by nature are themselves bodies or whether they are nonbodily essences that are, however, in a material and a body. When he had investigated the case closely, it became obvious to him that that which gives circular motion to the bodies at the limits *is a certain being* [*mawjūd mā min al-mawjūdāt*] that cannot be a nature or a natural thing, or a body or in a body, or ever in a material at all.[111]

And a few pages later, al-Fārābī mentions only a single mover: "the thing [*al-shayʾ*] that supplies the heavenly bodies with perpetual circular motion."[112] In his summary of Aristotle's philosophy, then, al-Fārābī focuses on the First Unmoved Mover to the exclusion of the other unmoved movers.

But undue weight should not be placed on these passages, for they appear in the context of al-Fārābī's discussion of natural philosophy and more specifically of Aristotle's *Physics*. Since al-Fārābī probably had *Physics* 8 in mind in this passage, then it is normal that he would only allude to one unmoved mover. Furthermore, in *Aghrāḍ*, al-Fārābī provides a very brief yet highly significant summary of the aims of Book Lambda, in which he says that "[Book Lambda also deals with] the *separate existents* [*al-mawjūdāt al-mufāriqah*] that come after [the First Principle] and how their existence is ordered from [the First Principle]."[113] This statement concerning the aim of Book Lambda goes hand in hand with the reference to the same work that appears at the very end of *Fī l-ʿaql* and which is used to confirm the status of God as First Intellect in a series of separate intellects: "This [i.e., God] is the

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[110] Ibn Rushd (1984b, 168).
[111] Al-Fārābī (2001c, 102–103, my emphasis).
[112] Al-Fārābī (2001c, 129).
[113] Al-Fārābī (1999c, 38), McGinnis and Reisman (2007, 81, my emphasis).

intellect that Aristotle discusses in Book Lambda of *Metaphysics*. While each one of the other [separate principles] is also an intellect, this [God] is the First Intellect."[114] These two passages from *Aghrāḍ* and *Fī l-ʿaql* convincingly indicate that al-Fārābī construed Book Lambda as positing *several separate unmoved movers*. Judging from his own works, it appears that he made this principle one of the cornerstones of his cosmological model. In holding that there are several separate intellects moving the orbs, al-Fārābī thereby consciously aligned himself with what he believed was the true Peripatetic tradition.

This point is clear enough. But there are other complications. Al-Fārābī posits only one mover *per* celestial group (*jumlah*) and not, as Aristotle, one mover *per* orb and motion. If al-Fārābī had read the Arabic translations of Aristotle carefully (which he surely did), he could not have failed to grasp this point, which is conveyed very lucidly by the Usṭāth translation: "It is clear that there must be as many substances as there are motions." And the text logically concludes that there are 47 or 55 orbs, motion, and separate principles. But unlike the Greek and Arabic versions of Book Lambda, al-Fārābī rejects these numbers in favour of a system of only nine separate movers. Be it only for this reason, his model shows a marked departure from Aristotle's cosmology. As a corollary, Book Lambda should be regarded as only one of the sources to have informed al-Fārābī's cosmology, and one whose contents were transformed as a result of other influences. But what were the other sources that shaped al-Fārābī's interpretation? Examining how Book Lambda was interpreted by the Greek commentators can shed light on this question.

2.1.2. *Al-Fārābī and the Greek Commentators on the Unmoved Movers*

2.1.2.1. *Alexander and Themistius*

Recent attempts have been made to delineate with greater precision the late antique Greek sources underlying al-Fārābī's cosmology. In an article published in 1995, M. Maróth argued that Alexander's *Mabādiʾ* and Themistius' *Paraphrase of Aristotle's Book Lambda* exercised a decisive influence on al-Fārābī's cosmology. Maróth contends that Alexander's theories of the celestial souls and intellects and Themistius' model of a nine-orb heaven are key antecedents to understand the cosmology of Arabic philosophers such as al-Fārābī and Ibn Sīnā. Accordingly,

[114] Al-Fārābī (1938, 36, my translation).

these two texts, when added to the Aristotelian and Ptolemaic legacies, can account for what Maróth calls al-Fārābī's "decadic" cosmological scheme.[115] In the introduction to his translation of *Mabādiʾ*, C. Genequand also stresses the relevance of Alexander's work for studying al-Fārābī's cosmology, although the common features he discusses are not the same as those highlighted by Maróth.[116]

Maróth's article sheds valuable light on the relation between al-Fārābī and the works of the Peripatetic and Neoplatonic commentators, especially Alexander. It is undeniable that Alexander's *Mabādiʾ* foreshadows some of the basic ideas of al-Fārābī's cosmology, such as the influence of the heavenly bodies on the sublunary world, the parallel made between the cosmic order and the social order, and the emphasis on the ensoulment of the orbs. More specifically, Maróth is right, in my opinion, to trace al-Fārābī's equation between the souls and the forms of the celestial bodies to Alexander,[117] a doctrine which he may have known not only through *Mabādiʾ*, but also through other fragments derived from *Quaestiones*.[118]

With regard to the number of the unmoved movers and orbs in the works of Alexander and Themistius, however, the problem is more complex. Maróth's discussion of this point in *Mabādiʾ* is marred by the fact that he refers to Alexander's commentary on Books Lambda and Nu of *Metaphysics* for support, which have been shown to be inauthentic.[119] On the basis of these texts, Maróth argues that Alexander posits 47 or 55 cosmic intellects, which correspond to an equivalent number of orbs and celestial motions.[120] But this is likely to be a misinterpretation caused by Maróth's reliance on the spurious sections of the *Metaphysics* commentary. In *Mabādiʾ*, Alexander does not mention these numbers, and the passages dealing with the unmoved movers in this work are ambiguous to the extent that it is difficult in the final analysis to establish whether he posits one or several separate unmoved movers.

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[115] Maróth (1995); but cf. Maróth's (1994) longer analysis of the *falāsifah*'s cosmology, which provides valuable insight into the sources used by these thinkers.

[116] Alexander (2001, 21–22).

[117] Maróth (1995, 108).

[118] For *Quaestiones*, see Alexander (1992b); for its reception in the Arabic context, see Fazzo and Wiesner (1993), Hasnawi (1994), and Sharples (2003).

[119] See Dooley ("Introduction" in Alexander 1992a, vol. 1, 3), Alexander (2001, 22, note 38), and Sharples (2003). Only the first five books are by Alexander; the other nine were composed by the twelfth-century commentator Michael of Ephesus.

[120] Maróth (1995, 106, 108).

The text contains conflicting evidence that can be used to support either view. In several passages, Alexander argues that since the motion of the heavens as a whole is regular and continuous, there can only be one unmoved mover, which he identifies with God. In contrast, in another passage, he seems to be alluding to several separate unmoved movers.[121] This being said, the balance seems to tilt in favour of there being only one unmoved mover identified with God, a conclusion reached by both C. Genequand and G. Endress in their studies of the Arabic version of the text.[122]

The question of the number of orbs in Alexander's cosmology is equally difficult to settle. As Genequand notes, *Mabādiʾ* seems to put forth a system of eight main celestial orbs.[123] This is confirmed explicitly by *Quaestiones*, which mentions eight orbs, and implicitly by some passages in Simplicius' commentary on *On the Heavens* in which Alexander refers to the "orb of Saturn" and the "orb of Venus," thus betraying a simplified cosmology that takes into account only the main orb of each planet.[124] In this connection, Bodnár has shown convincingly that Alexander often represents the cosmos as consisting of eight principal orbs, which nonetheless probably comprise several other minor orbs and spheres.[125] Hence, one cannot conclude from the evidence of *Mabādiʾ* alone that Alexander followed Aristotle's astronomical model of 47 or 55 orbs.

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[121] Cf. Alexander (2001, 66–71, 87–88, and 90 ff.).

[122] For Genequand, see Ibn Rushd (1984b, 41) and Alexander (2001, 14): "Thus, on balance and in spite of some uncertainties, the overall evidence definitely weighs against the hypothesis of a plurality of separate movers." See also Endress (2002) and Sorabji (2005, vol. 2, 340–341), who simply underlines the ambiguity without taking sides. It should be noted that this reading of *Mabādiʾ*, i.e., that there is only one separate unmoved mover that is identified with God, does not completely agree with the information that can be found in Alexander's other works preserved in Greek. As was said before, Sharples (2003, 199) believes that the Greek Alexander upheld the theory of several separate unmoved movers.

[123] Alexander (2001, 10, 92–95).

[124] *Quaestio* 1.25.25-30: "There are several spheres of the divine body, and the first and outermost is moved in a simple and single movement by desire for that being; of the seven after it too each is moved by desire and appetition for some being." See also Sorabji ("Preface" in Simplicius 2002, x), Simplicius (2005, 472,8 ff. and 474,5 ff.). It is surprising that Maróth does not mention the *Quaestiones* at all in his discussion, as it represents an important source for Alexander's cosmology.

[125] Bodnár (1997, 196–200). Bodnár writes: "My contention then is that Alexander after talking about *the* sphere of Saturn, Jupiter etc., could keep the possibility open to talk, on occasion, about the very same entity as a bundle of different spheres, in whatever pattern they are arranged by a viable astronomical theory" (198). Cf. with the previous discussion of the celestial bodies in chapter 2, 1.

Maróth's statements concerning the influence of Themistius' *Paraphrase* on al-Fārābī are equally problematic, as he was apparently not aware of the existence of the extant Arabic excerpts of this paraphrase.[126] According to Maróth, Themistius only posits nine celestial orbs and thus nine celestial movers, and he suggests that this innovation was responsible for al-Fārābī's cosmological model.[127] But to my knowledge, no passage in the Hebrew and Arabic texts articulates this view, and Themistius plainly develops in chapter 8 of his commentary a model based on the theories of Aristotle (and indirectly Callipus and Eudoxus), which posits a total of 47 or 55 orbs. In addition, Themistius explicitly states that the number of motions, orbs, and movers must be the same and that therefore the number of movers also amounts to 47 or 55.[128] Finally, although Themistius lived after Ptolemy, he does not mention the Ptolemaic theories of eccentrics and epicycles and most probably adhered to the homocentric astronomical model which he describes in his commentary.[129]

The picture that emerges from the foregoing analysis is as follows. There are only very few similarities between al-Fārābī and Themistius. Perhaps the main point worth noting is that Themistius posits a plurality of movers. But whereas he mentions 47 or 55 movers, al-Fārābī only speaks of nine celestial movers; and Themistius says nothing as to whether these movers are separate or inhere in the orbs. There are, on the other hand, more significant parallels between Alexander and al-Fārābī. First, Alexander appears to have reduced Aristotle's system of 47 or 55 orbs to a simpler system of eight main orbs, and second, his *Mabādiʾ* may also be construed as positing several separate movers. Alexander therefore effected a simplification of the Aristotelian model

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[126] For the Arabic excerpts, see Badawī (1947, 12–21) and the translation by Brague (in Themistius 1999).

[127] Maróth (1995, 109–110).

[128] Badawī (1947, 19) and Themistius (1999, 103).

[129] This is also Bodnár's (1997, 203) conclusion and it is acknowledged by Brague (Themistius 1999, 102). This being said, there is one odd feature in Themistius' commentary. At one point (88) Themistius seems to make a distinction between the orb of the fixed stars and the outermost orb, which, following Aristotle (Λ1072a22-23), he calls the "first heaven." However, for Aristotle the "first heaven" is the orb of the fixed stars. There are, I think, two possible explanations for this discrepancy: either Themistius interpreted Aristotle through Ptolemy's astronomical model as exposed in *Planetary Hypotheses*, which posited an additional starless orb; or the Arabic author responsible for the translation or adaptation of Themistius' paraphrase modified this passage in light of his own understanding of cosmology, which was probably based on the Ptolemaic model.

that resulted in something closer to al-Fārābī's own solution to the problem.

But more should be said about the latter two points. According to Bodnár, Alexander's scheme of eight orbs and his attribution of one main orb to each planet was common practice by his time, and other thinkers, such as Adrastus of Aphrodisias and the Platonist Alcinous (who both flourished in the second century CE), had done the same.[130] This way of representing the cosmos, which was made possible by Ptolemy's work, and which may have arisen out of a reaction vis-à-vis the problems inherent in the Aristotelian kinematic model, was transmitted to the Islamic world. It corresponds to al-Fārābī's and Ibn Sīnā's cosmologies in *Ārāʾ* and *Shifāʾ* respectively, although the two thinkers added an additional orb, the outermost starless orb. This affiliation with the Greek tradition emphasizes the continuity between Alexander and al-Fārābī and enables us to better grasp the historical origin of the Second Teacher's ennadic cosmology. However, this simplified way of representing the cosmos should not obscure the fact that for all of these thinkers the number of orbs that actually exists is much higher. This is because the main orbs each contain several other minor orbs and spheres whose existence is necessary to explain the particular motions of the planets. The main parallel between Alexander and al-Fārābī, then, rests primarily on their describing a simplified cosmological system in their philosophical treatises, although they adhered to a more complicated astronomical model.

Second, with respect to the issue of the number of movers in *Mabādiʾ*, there is some evidence that Arabic thinkers such as al-Fārābī and Ibn Sīnā interpreted this text as positing several *separate* movers in addition to the First Unmoved Mover. There is one particular passage in *Mabādiʾ* that lends itself to this interpretation:

> Let us posit that the noblest of these things and the most deserving to be the first is the mover of the sphere of the fixed stars [*al-muḥarrik li-kurat falak al-kawākib al-thābitah*] [i.e., Aristotle's First Unmoved Mover]; through the latter it also moves the things moved by it; the following is the mover of the second sphere [*al-muḥarrik li-l-kurat al-thāniyyah*], and after it the mover of the third sphere, and so on with all the other things.[131]

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[130] Bodnár (1997, 198).
[131] Alexander (2001, 92–95).

In this passage Alexander may be interpreted as positing a separate unmoved mover for each main orb of his system, although he does not specify whether the other movers after the First are separate from or inhere in the celestial bodies. But here one may cite a crucial passage from Ibn Sīnā's *Metaphysics* of *Shifāʾ* that seems to vindicate this reading of *Mabādiʾ*. When addressing the thorny question of the unmoved movers in Aristotle's philosophy, Ibn Sīnā writes:

> It is impossible that the first mover of the whole of heaven should be more than one, even though there is for each of the celestial orbs a proximate mover proper to it, and an object of desire and love proper to it, as the First Teacher and *those Peripatetic scholars of attainment after him see it. For they deny multiplicity only [in] the mover of all [things] and affirm multiplicity in the movers, both [those] separated [from matter]* [*li-l-muḥarrikāt al-mufāriqah*] *and [those] not separated, that specifically belong to each one of the celestial orbs. They thus make the first of the specific separated [entities] the mover of the first orb*. [This,] for those who preceded Ptolemy, is the orb of the fixed stars; and, for those who learned the sciences that became manifest to Ptolemy, [it] is an orb outside the [former] which surrounds it and is without stars. *After this, [they made] the [second of the separated entities] the mover of the orb that follows the first* in accordance with the difference of the two views, and so on.[132]

Ibn Sīnā in this passage intimates that not only Aristotle, but also the Peripatetic commentators who flourished after him, posited several *separate* unmoved movers (*muḥarrikāt mufāriqah*) to explain celestial motion. He then goes on to add:

> One of his [Aristotle's] followers, who is more sound than [other followers] in what he says, declares and states in his treatise on the *Principles of the Whole* [*fī risālatihī allatī fī mabādiʾ l-kull*] that the mover of the entire heaven is one, it being impossible for it to be numerically many, even though for each of the orbs there is a mover and an object of desire specifically its own.[133]

Immediately after this passage, Ibn Sīnā describes the view of another Aristotelian follower, probably Themistius. This thinker posits "the existence of a principle of motion belonging specifically to [each celestial orb] as being an object of love separated [from matter]," and he concludes that "these two are the closest among the disciples of the First Teacher to being on the right path."[134] Ibn Sīnā is here providing

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[132] Ibn Sīnā (2005, 317,2–15, translation revised).
[133] Ibn Sīnā (2005, 317,20–25, translation revised).
[134] Ibn Sīnā (2005, 317,30–33).

examples of specific thinkers who, according to him, followed Aristotle in upholding several separate unmoved movers in their cosmology, something which he praises highly. Now, there can be little doubt that the first follower described by Ibn Sīnā is Alexander, since he mentions Alexander's treatise by its title (*fī risālatihī allatī fī mabādiʾ l-kull*). If this is the case, then this excerpt represents solid evidence that according to Ibn Sīnā, Alexander defended the theory of multiple separate unmoved movers. Although Ibn Sīnā does not specify that these unmoved movers are *separate* [*mufāriqah*] in the sentence that deals expressly with Alexander, the general context in which his statement appears convincingly indicates that this (on Ibn Sīnā's view) is how Alexander construed them.

On the basis of the foregoing analysis, it appears that al-Fārābī could have anticipated Ibn Sīnā in interpreting *Mabādiʾ* as positing several separate movers. When this point is connected with the simplified system of orbs exposed in *Mabādiʾ*, we reach a cosmic picture of eight main orbs and several *separate* unmoved movers (possibly eight). This model would correspond closely to that of al-Fārābī, who nevertheless added an extra orb and an extra mover as a result of the theory of the ninth, outermost orb upheld by Ptolemy and adopted by most Arabic astronomers. I would argue, then, that in spite of its ambiguity, *Mabādiʾ* contains some of the key features of al-Fārābī's cosmology and significantly shaped his interpretation of Aristotle's theory of the unmoved movers.[135]

2.1.2.2. *Simplicius*

Simplicius' commentary on *On the Heavens* appears to be an equally promising source for understanding the philosophical roots of al-Fārābī's cosmology. Although this work was apparently not translated in Arabic either in full or in part, the evidence for Simplicius' influence

[135] This being said, the differences between al-Fārābī and Alexander are also significant: Alexander posits eight main orbs, whereas al-Fārābī posits nine orbs; Alexander may have adhered to a homocentric astronomical model, whereas al-Fārābī was clearly an exponent of the Ptolemaic one. Moreover, *Mabādiʾ* cannot account for the very unique function that al-Fārābī ascribes to the separate intellects. The complex theory of twofold and threefold intellection of the souls and separate intellects found in al-Fārābī's cosmology is completely absent from *Mabādiʾ*. On the other hand, the central concepts discussed in *Mabādiʾ* in connection with motion, namely, impulse (*ishtiyāq*), inclination (*mayl*), imitation (*iqtidāʾ*) and assimilation (*tashabbuh*), are not developed in the Fārābīan corpus, although they play an important role in Ibn Sīnā's account of celestial motion in *Shifāʾ*.

on Arabic philosophy is slowly increasing, as more and more parallels between his ideas and those of Arabic thinkers are emerging.[136] The present inquiry is a case in point. Like Alexander, Simplicius appears to have drastically altered Aristotle's complex astronomical model. At one point in his *On the Heavens* commentary, Simplicius writes the following:

> It has not been shown that it [i.e., the heavens] is one orb (since he [Aristotle] knows that the planetary is different from the fixed and he knows the division of the planetary into several <orbs>), but that there is one cosmos with a system of eight orbs and not several heavens which fill out more than one cosmos.[137]

Although in this chapter of his commentary Simplicius is discussing the impossibility of there being several worlds, he gives a vital piece of information concerning his conception of the heavens: these can be reduced to eight main orbs, to a "system of eight orbs." Hence, like Alexander, Simplicius, following what seems to have been a fairly common trend in late Greek cosmology, presents a simplified astronomical model consisting of eight main orbs, which, one assumes, contains several other components, such as planets, stars, and perhaps smaller counteracting orbs or epicycles, depending on the nature of his planetary models.[138]

There is another passage in Simplicius' commentary indicating that he *may* have accepted a ninth starless orb. Simplicius writes:

> When I was present in Alexandria, our master Ammonius observed Arcturus using an armillary sphere and found that it had moved forward so much with respect to its position at the time of Ptolemy as to require that it had one degree of contrary motion in one hundred years. So perhaps it would be truer to say that the starless orb which contains <all the orbs>, of which it seems there was no knowledge at the time of Aristotle,

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[136] Grignaschi (1969, 185–186) noted interesting parallels between al-Fārābī's writings and a work by Simplicius. Walzer (al-Fārābī 1985a, passim) also refers to Simplicius on several occasions in his commentary on *Ārā'*. See also Gätje (1982), Stone (2001), and Wisnovsky (2003b, passim). As Hugonnard-Roche (2003, 289) writes: "On ne trouve pas d'attestation d'une traduction arabe du commentaire de Simplicius [on *On the Heavens*] chez les bibliographes arabes, mais on ne devrait pas pour autant en conclure trop rapidement que l'ouvrage ait été totalement inconnu: des recherches restent à faire sur ce sujet." See also Vallat (2004, 368).

[137] *CAG*, vol. 7, 435,1–5; translated by Mueller (in Simplicius 2004a, 435,1–5, translation slightly revised). The Greek reads ἓν ὀκτάσφαιρον ἑνὸς κόσμου for "one cosmos with a system of eight spheres."

[138] See the previous section on Alexander and Bodnár (1997).

> carries around all the other <orbs> with its single simple motion from the east.[139]

In this passage, Simplicius refers to a starless orb that would be located beyond the orb of the fixed stars. Although he is not consistent in upholding the existence of this ninth orb, it would seem that he and perhaps his master Ammonius (son of Hermeias, d. ca. 520 CE) devised a system of nine main celestial orbs identical to the one later adopted by al-Fārābī and Ibn Sīnā. Furthermore, Simplicius discusses in several parts of his commentary the way in which the Ptolemaic theories of the eccentrics and epicycles, as well as other aspects of Ptolemaic astronomy, can be integrated in what is otherwise an Aristotelian cosmological framework.[140] This harmonizing attempt may be explained by the fact that Simplicius thought highly of Ptolemy's achievement, as is clear when he calls Ptolemy "the best of the astronomers."[141] Hence, both Simplicius' cosmology and his attempt to reconcile some aspects of Ptolemaic astronomy with Aristotelian cosmology anticipated the efforts of al-Fārābī and other Arabic *falāsifah*.

Finally, Simplicius posits several unmoved movers, and he criticizes Alexander for interpreting Aristotle as positing only one mover. In one passage of his commentary, for example, he writes, *pace* Alexander, that "Aristotle does not say that the mover of the revolving body is single, but rather that while the single movement of the fixed [orb] is caused by the first substance, each of the wandering spheres is moved by an unmoved, eternal substance."[142] Although he does not say so explicitly, Simplicius probably regarded these movers as being separate from the celestial bodies, since he criticizes Alexander expressly for his belief in one separate mover, i.e., for recognizing the existence of the First Unmoved Mover only. In spite of the fact that Simplicius does not specify the number of unmoved movers in his commentary, it is possible to connect this text with the other excerpts discussed above and to hypothesize that he may have ascribed one separate mover to each main orb, i.e., eight or nine movers excluding God. His claim in the above citation that "each of the wandering spheres"

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[139] Simplicius (2004a, 462, 20–25, translation slightly revised).

[140] Simplicius (2005, ch. 2.10–12). However, as Sorabji notes in the preface (1–2), Simplicius ascribes the invention of the eccentrics to Pythagoras.

[141] Simplicius (2004a, 456, 22).

[142] Simplicius (2004b, 270, 15 ff., translation slightly revised) and *CAG*, vol. 7, 270, 15 ff. for the Greek.

(τῶν δὲ πλανωμένων σφαιρῶν ἑκάστην) is moved by an unmoved mover is ambiguous, since Simplicius could be referring in this passage either to the main orbs alone or to all the orbs and spheres associated with a planet, in which case the number of movers would be much higher.

Regardless of this ambiguity, Simplicius' work should be seen as a potential precedent for al-Fārābī's model, together with Alexander's *Mabādi'*. These texts share several germane ideas with al-Fārābī's emanationist treatises. To begin with, they describe a simplified cosmological model consisting of eight or nine main orbs, while at the same time implicitly upholding the existence of other minor orbs and spheres. Moreover, these thinkers likely interpreted Aristotle's unmoved movers as *separate* substances, and it is even possible that they equated the total number of movers with the number of main orbs, i.e., eight or nine. The similarities are reinforced by the fact that Simplicius, following his master Ammonius, conceives of God not only as a final cause, but also as an efficient cause of creation, a doctrine which occupies a central place in the thought of the *falāsifah*.[143] God is responsible for the world's (beginningless) causation and sustenance, and He stands also as the highest end that all beings aspire to attain in a movement of reversion toward the One. This is exactly the view developed by al-Fārābī in his later emanationist treatises.

The astronomical and metaphysical parallels outlined above strongly suggest the possibility that al-Fārābī was acquainted with the works of thinkers from the Ammonian school, especially with Simplicius, who was one of its outstanding members. But there is one important difference in these thinkers' cosmologies: while al-Fārābī makes each separate intellect an efficient cause for the existence and sustenance of its corresponding orb, Ammonius and Simplicius seem to reserve efficient causality to God and do not explicitly connect the existence of each main orb or 'system' with a separate principle. It is difficult to pinpoint when and how this cosmological elaboration occurred in the late antique Greek and early Arabic philosophical contexts, and whether al-Fārābī was its sole author. One may nevertheless hypothesize that

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[143] For a clear statement of this view, see Simplicius (2004b, 271,12–20), as well as Sorabji's preface in the same work (x); and Hankinson ("Introduction" in Simplicius 2002, 7). For discussions of final and efficient causality in late antique Neoplatonism and Arabic philosophy, see the relevant studies in *Aristotle Transformed*, edited by Sorabji, Wisnovsky (2002, 2003a, and 2003b), and Bertolacci (2005a and 2006).

al-Fārābī's theory is a generalization of the Neoplatonic tendency of construing the Aristotelian First Unmoved Mover as an efficient cause. Al-Fārābī applies to each unmoved mover/separate intellect of his cosmology the causative activity that Ammonius, Simplicius, and others had ascribed to the Aristotelian divinity. However, a more convincing interpretation that will be discussed later on is that al-Fārābī was influenced by some of Proclus' metaphysical theories, which ascribe causative and demiurgic powers to a plethora of intellectual entities.

In any case, in maintaining a level of intellectual beings between the First and the celestial bodies, al-Fārābī's cosmology departs radically from that of previous Arabic thinkers, such as al-Kindī and Abū Maʿshar. According to these thinkers, the celestial bodies are intermediaries between God and the sublunary world, and in this capacity they carry out God's providence through their continuous influence on the realm of generation and corruption. For al-Fārābī, in contrast, between God and the celestial bodies lies the realm of the immaterial intellects, or *thawānī*, with the immediate result that the role of the heavenly bodies as intermediaries between God and the sublunary world is drastically modified. In theory, these intellects should stand as a new kind of intermediaries between the First and the corporeal world of the heavens, but they in fact possess a high degree of autonomy and causative powers of their own.

This structural difference between the cosmologies of al-Fārābī and previous Arabic thinkers such as al-Kindī and Abū Maʿshar should not be underestimated. From an epistemological point of view, this privileged intermediary status assigned to the heavens meant that the astrological investigation was justified and could yield knowledge about divine providence and even about some aspects of the divine nature itself. This explains why both al-Kindī and Abū Maʿshar held astrology in such high esteem. It also partly explains why al-Fārābī did not share their faith in astrology—in addition to the purely methodological qualms he had with this science—and why he does not perceive the celestial bodies as transmitters of divine providence in the way envisaged by these earlier thinkers. In addition, and more significantly from a metaphysical perspective, the disjunction he introduces between the First and the celestial bodies enables al-Fārābī to articulate a completely different account of creation and causality, since God becomes only one cause among a multiplicity of eternal efficient causes responsible for causing the existence of the material universe (ch. 3, 2.6.). Hence, al-Fārābī's articulation of the Aristotelian theory of the unmoved

movers announced a new way of framing and conceiving causality in the superlunary world, one which dispensed with the creationist and astrological model of al-Kindī, and which relied instead on a subtle conceptualization of efficient and final causality distributed on several levels. In that sense, al-Fārābī's theories must be regarded as an important development in the early history of Arabic metaphysics and cosmology.

2.2. *A New Problem*

In the foregoing discussion, I argued that the structure of al-Fārābī's cosmology, especially with regard to the separate intellects, is based on a particular interpretation of *Metaphysics*, Book Lambda, which was informed by some late antique works expounding on this seminal text. It was shown that Alexander's and Simplicius' views anticipated some important aspects of the ennadic system developed by al-Fārābī. What is striking about these works is that they combine the cosmological theories of Book Lambda with a revised astronomical model, thus anticipating a salient trait of al-Fārābī's method. At a structural level, then, al-Fārābī's cosmology was shaped considerably by some of the philosophical and astronomical developments that occurred in late antiquity.

Yet despite these important clarifications, there remains a crucial problem, which is not fully accounted for by the sources and which the foregoing interpretation does not adequately explain. Why is there no correlation in al-Fārābī's system between the number of separate intellects and the number of planetary motions and orbs? It is worth recalling here that al-Fārābī upheld the materiality of the various celestial entities, including the eccentrics and epicycles. Since each main orb contains various other minor orbs and spheres in addition to the planet—each entity (with the possible exception of the planet) possessing its own motion—it would be necessary, for al-Fārābī's 'Aristotelian' system to be functional, that each orb and sphere contemplate its own separate intellect, which is defined as a mover (*muḥarrik*) in *Fī l-ʿaql*.[144] If he were truly following the model developed in Book Lambda 7 and 8, then he would, like Aristotle and some of the later commentators, have posited as many movers as there are celestial orbs and motions. Themistius in his *Paraphrase*, for instance, follows Aristotle

[144] Al-Fārābī (1938, 34).

in arguing that there are 47 or 55 orbs, and then states that "it is necessary that the number of motions be equal to the number of orbs that move, and that the number of motive causes be equal to the number of motions."[145] Why does al-Fārābī depart from the Stagirite and his commentator Themistius on this point and limit the number of movers to nine (excluding the First Cause and the Agent Intellect)?

There are, I believe, two plausible solutions to this problem. The first one is that al-Fārābī conceived of the separate intellects primarily as causes of being and only secondarily as causes of motion. Each intellect is responsible for producing a main orb, which may include, as we have seen, stars or a planet as well as other minor orbs and spheres embedded within it. In other words, each intellect produces a celestial "system" (*jumlah*) to use al-Fārābī's terminology. Unlike the cosmology of Aristotle and other Greek thinkers where the relation between the orbs and the separate intellect(s) is limited to motion, al-Fārābī also defines it in terms of efficient causality, arguing that each separate intellect is the efficient cause of its corresponding celestial system. This is why he begins his account in *Ārāʾ* by explaining how the orbs are caused, and only afterwards addresses the question of their motion.[146] This also explains why in *Fī l-ʿaql*, al-Fārābī describes the separate intellects as "movers," but instead of proceeding to a discussion of motion (as one would expect), he focuses solely on the question of the existence and causation of the orbs.[147]

It is this very emphasis on the efficient activity of the separate intellects that may explain why al-Fārābī only posits nine intellects, a number which obviously does not correspond to the number of planetary motions and celestial bodies. By definition, the separate intellects have a dual intellection, and as a result of this dual intellection, they can only produce two distinct effects: one is the existence of another intellect, and the other is the existence of a main orb together with its soul, i.e., a planetary 'system.' This also implies that the same cause is made to account for a diversity of corporeal components within a celestial 'system.' Now, if al-Fārābī had wanted to assign a specific efficient cause to each corporeal component in the heavens (i.e., to all the main orbs, minor orbs and spheres, planets, and stars), he would have had to introduce a plethora of intellects, which would have significantly

[145] Badawī (1947, 19) and Themistius (1999, 103).
[146] Al-Fārābī (1985a, 101–135 and 1985b, 61–76).
[147] Al-Fārābī (1938, 34–35).

complexified his account and altered its simple elegance. According to this interpretation, then, al-Fārābī's priority in devising his cosmological system was not the question of celestial motion, but rather to provide an explanation of the existence of the heavens that relies on as few causes as possible. His main consideration was of an ontological order and focused on the concept of efficient causality, not on celestial kinematics. If this is true, it would underline the gap between the cosmological projects of Aristotle in Book Lambda 7 and 8 and of the Greek commentators on the one hand and the aim of al-Fārābī on the other.

The historical process by virtue of which this interpretation may have occurred cannot be discussed in detail here, as it deals with efficient causation and creation and will accordingly be treated in chapter 3 of this book. Suffice it to say that it is likely in my view that al-Fārābī may have construed the Aristotelian movers as efficient causes or beings endowed with demiurgic powers by following some of the Athenian Neoplatonists, such as Proclus and his master Syrianus. As the extant parts of Syrianus' *Metaphysics* commentary testify, these late antique Greek thinkers had already transformed the Aristotelian unmoved movers in light of Neoplatonic elaborations on causality, intellection, and demiurgy. In this respect, they anticipated al-Fārābī's own metaphysical system in emphasizing the role of these beings as cosmic principles of existence and unity.[148]

A second line of interpretation—briefly intimated, but not developed at any length by Walzer—focuses instead on the question of celestial motion.[149] A convenient starting point for discussing it is a passage that appears in the *Metaphysics* section of Ibn Sīnā's *Shifāʾ*. Ibn Sīnā begins by stating the following:

> In sum, it is inevitable that each [of the orbs] that moves for a rational end should have an intellectual principle that intellectually apprehends the First Good and that the essence [of this intellectual principle] is separated [from matter].[150]

Having associated one separate intellect or mover *per* orb, Ibn Sīnā then goes on to discuss whether a separate intellect should be ascribed

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[148] See chapter 3, 2.6.1–2 and Janos (2010a) for an analysis of how al-Fārābī applied Neoplatonic theories on causation and intellect to the unmoved movers of his cosmology.

[149] See Walzer (in al-Fārābī 1985a, 365–366) and De Smet (1995, 276–277).

[150] Ibn Sīnā (2005, 325,20–23).

only to the main orbs or to each individual orb, including the subordinate ones:

> Thus, the number of the separate intellects after the First Principle would be the same as the number of movements. If, in the case of the orbs of the wanderers [*li-aflāk al-mutaḥayyirah*], the principle of the movement of the spheres[151] of each planet therein is a power emanating from the planets [*quwwah tafīḍu min al-kawākib*], then it would not be unlikely that the separate [intellects] would have the same number as the number of these [planets]—not the spheres—and their number would be ten, after the First. Of these, the first would be the unmoved mover that moves the orb of the outermost body, then the one similar to it [that moves] the orb of the fixed stars, then the one that is like it [that moves] the orb of Saturn, and so on, terminating in the intellect that emanates on us—namely, the intellect of the terrestrial world, which we call the active intellect. If, however, this is not the case, but each moving orb has a rule governing its own motion and every star, then these separate [intellects] would be of a greater number. It would follow, according to the doctrine of the First Teacher, that there would be something close to fifty and over, the last being the active intellect. But you have known, from what we have said in the *Mathematics*, what we have attained in ascertaining their number.[152]

This passage is of primary importance for several reasons. First, it shows that Ibn Sīnā was conscious of the basic tension under discussion, which he probably inherited alongside al-Fārābī's cosmology. In this passage, Ibn Sīnā envisages the possibility of two systems of celestial motion. In the first one, only one separate intellect *per* main orb (or system) is posited, and the motion of the other subordinate orbs and spheres is explained in terms of a power (*quwwah*) that emanates from (*tafīḍu min*) the planet. In the second model, all the orbs, both the main ones *and* the subordinate ones, are moved by an unmoved mover, as in Aristotle's model, which attributes a mover *per* motion and *per* orb.[153] Ibn Sīnā's account enables us to confirm not only that the coexistence of these various kinematic models was seen as a genuine problem by medieval Arabic cosmologists, but also that each one of them represented a valid explanation of celestial motion. It is likely that Ibn Sīnā's

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[151] Marmura translates this term in the singular, although the Arabic is *kurāt*. This has the unfortunate effect of changing the entire meaning of the sentence, since Ibn Sīnā's point here is based precisely on the distinction between the main orbs of the planets and the other subordinate orbs and spheres they contain.

[152] Ibn Sīnā (2005, 325,30–326,8, translation revised).

[153] And this would be true regardless of whether one adheres to a homocentric or Ptolemaic model. What is important here is the attribution of one mover *per* orb and motion, regardless of whether these orbs are counteracting orbs, eccentrics, etc.

awareness of this problem was shared by his predecessor al-Fārābī, although no comparable passage can be found in the Second Teacher's works.

Second, the *Shifāʾ* passage vindicates the reading that was proposed earlier concerning the various kinds of orbs in al-Fārābī's system. It indicates that besides the main planetary orbs, Arabic thinkers posited smaller, subordinate orbs and spheres, which altogether combined to form a single unit governed by a separate intellect. Finally, this passage helps to understand why someone like al-Fārābī may have reduced the number of movers and posited only one separate intellect *per* system, and not *per* orb and motion: he may have developed a particular theory of celestial motion that did not require the 47 or 55 movers mentioned by Aristotle, and which in contrast involved the existence of powers emanating from the planet embedded in each system.[154] This hypothesis, which will be discussed at length in chapter 4, indicates that al-Fārābī may have devised a kinematic model akin to the first one described by Ibn Sīnā in this passage of *Shifāʾ*.

The two interpretations proposed above, which, it should be noted, are not mutually exclusive, can account satisfactorily for the fact that al-Fārābī departs from Book Lambda and does not posit a separate principle *per* heavenly motion and *per* celestial orb, but simply one separate intellect per main orb or 'planetary group,' to use al-Fārābī's terminology. By making each intellect the efficient and final cause of the various elements of a celestial system, al-Fārābī is displaying a great economy of intelligible principles, a kind of Ockham's razor adapted to his cosmology. Unlike Proclus, who posits a plethora of immaterial, intelligible principles, al-Fārābī, I believe, aims to establish a balance between the deductive and the inductive, between experience and observation on the one hand and deduction and synthesis on the other, and both are to meet midway methodologically in his cosmology. Understandably, al-Fārābī does not want to posit more principles than are necessary to explain the world of nature and the existence of the heavens. He achieves a much more unified synthesis between the perceptible and the immaterial, between induction and deduction than does Proclus, for example, whose innumerable deities and other intelligible principles do not have an exact corporeal counterpart.

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[154] This point will be examined in more detail in chapter 4, which is devoted to celestial motion.

Indeed, the economy of principles underlying al-Fārābī's system suggests a careful and well-thought-out theorizing of these cosmological problems in his philosophy.[155]

We may conclude that al-Fārābī's theory of the nine separate intellects and of how these fit in a new astronomical model derived from Ptolemy developed out of a sustained exegetical effort and a process of adaptation of the ancient sources. The simplified cosmological structure of nine main orbs, the theory of the ensoulment of the heavens, the existence of a plurality of separate intellects responsible for causing their motion, and the attempt to reconcile Ptolemaic kinematic theories with physical and metaphysical ideas, are features that can be traced back partially to the works of Alexander and Simplicius. Hence, it is clear that al-Fārābī's interpretation of Book Lambda was mediated and shaped by several layers of philosophical exegesis, a hypothesis which will be further substantiated with regard to his theories of celestial matter and causation in the next chapter. In spite of these parallels, however, it should be noted that no single Greek source contains all the features adopted by the Second Teacher and harmoniously synthesized in his works. This should stand as a reminder that, while profoundly engaged in the study of the late antique literature, al-Fārābī displayed critical insight and creativity in his approach to these sources, especially with regard to his theory of the nine separate intellects. The latter should be considered as an important cosmological development in Arabic philosophy and as an original interpretation of the Aristotelian theory of the unmoved movers.

2.3. *The Nature, Activity, and Knowledge of the Separate Intellects*

The separate intellects or *thawānī*, like the First (Itself an intellect) and the celestial souls, have intellection (*taʿaqqul*) as their principal activity. However, unlike the First, which contemplates only Its essence, and the celestial souls, which apprehend three intelligibles, the intellection of each separate intellect (with the exception of the Agent Intellect) focuses on two objects: the First, and its own essence. This model is

[155] Ibn Sīnā definitely inherited al-Fārābī's approach, for as he explains on several occasions, the number of unmoved movers or separate intellects can be elucidated through the art of astronomy and therefore through observation. The question of the number of unmoved movers is therefore intimately tied to the question of the number of perceived planetary motions and celestial bodies; see Ibn Sīnā (2005, 14–15; 326, 7–8).

developed in some detail in *Ārāʾ* and *Siyāsah*, and it also appears briefly in *Fī l-ʿaql*. One passage of the latter treatise conveniently encapsulates these various points: "Now, since the mover of the first heaven is neither matter nor in matter, it necessarily follows that it is an intellect in its substance, in which case it contemplates itself and the very thing that is the principle of its existence [i.e., the First]."[156] Due to their having two objects of thought, the intellects are not completely simple beings and are affected by multiplicity or complexity (*kathrah*), which is nevertheless not as great as that of the celestial souls.[157] According to Neoplatonic metaphysics, which al-Fārābī follows on this point, the higher one progresses on the ontological hierarchy, the more perfectly the concepts of unity and simplicity are expressed, until one reaches the First, which is absolutely one and simple. Conversely, as one descends this ontological ladder, one encounters an increasing degree of multiplicity. Al-Fārābī's theories of celestial intellection should be construed in light of this hierarchical ontological framework.

As in the previous discussion on the celestial souls, one notices striking parallels between al-Fārābī's theory of the intellects and the doctrines of the *Proclus arabus*. The first entity to emerge from the First Cause is conceived of in similar terms by al-Fārābī and the Arabic adaptors of Proclus, namely, as a separate intellect. On this point, they depart from the historical Proclus, for whom the One first emanates Being, then Life, then Intellect. The elimination of these intermediary entities between the One and Intellect is, together with the equation of God and Pure Being, the most notable and radical transformation undergone by the Greek Proclus in the Arabic context.[158] This being said, the Arabic adaptors and al-Fārābī follow Proclus quite closely in their conception of the intellect's substance, activity, and knowledge.[159]

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[156] Al-Fārābī (1938, 35), McGinnis and Reisman (2007, 77, translation revised). The Arabic reads: *wa-idh muḥarrik al-samāʾ l-ūlā lā māddata wa-lā fī māddah lazima ḍarūratan an yakūna ʿaqlan fī jawharihī fa-huwa yaʿqilu dhātahū wa-dhāt al-shayʾ alladhī huwa mabdaʾ wujūdihī*. This citation shows convincingly that al-Fārābī had already developed his theory of celestial intellection during the period of composition of this treatise. In turn, this indicates that Mahdi's claims about the specificity of the cosmological doctrine of *Ārāʾ* and *Siyāsah* is unfounded, since the same theories appear in other non-"political" works by al-Fārābī, such as *Fī l-ʿaql*; for *Ārāʾ* and *Siyāsah*, see al-Fārābī (1985a, 100–105, 116–117 and 1964, 52).

[157] Al-Fārābī (1964, 40).

[158] See D'Ancona (1995, especially 53–73, 73–97, and 121–155).

[159] With regard to these points of doctrine, Proclus himself was dependent on Plotinus' discussion of intellect in *Enneads*. See, among other sections, 5.1.5, 5.3.11, 5.3.12, 5.3.15, and 5.4.2.

In *Elements*, Proclus argues that the Primal Intellect is not completely simple, because it is composed of the duality of Finitude-Infinity. He then goes on to show that every intellectual being subsequent to the Primal Intellect possesses a certain plurality in its essence due to its thinking its own essence as well as its causes and effects. Hence, while the Primal Intellect derives its multiplicity from its being composed of Finitude and Infinity, the subsequent intellects are affected by multiplicity as a result of their various objects of thought. As Proclus writes in Proposition 167, "each subsequent intelligence knows simultaneously itself and its priors, so that its object is in part itself, but in part its source."[160]

These ideas reappear in the works forming the *Proclus arabus* corpus. In Proposition 4 of *Maḥd al-khayr*, it is said that the first originated being (i.e., Intellect) "receives multiplicity," because it is "composed of finitude and infinitude."[161] In *Liber de causis II*, the intellect is "multiple [*kathīr*] because of the virtues it receives from the First Cause."[162] More important for our purposes is the link between intellection and complexity in the other intellectual beings. In one of the propositions of the *Proclus arabus* edited by G. Endress, the author discusses the intellection of the intellectual beings and concludes: "It has been established by now that there exists a knowledge that knows its essence and knows what is above it, without the knower and the known being like one thing."[163] This theory also has a pendant in *Maḥḍ al-khayr*, where one finds the assertion that the intellects know what is above them and what is below them through their own substance.[164] In a way, this does not mean that a real complexity affects the intellects, since the knowledge of each intellect is nothing else than the knowledge of its own essence. In other words, the various kinds of knowledge of the intellects can be reduced to the knowledge they have of themselves. Accordingly, the adaptor of *Maḥḍ al-khayr* concludes that "the intellect and the intelligible things … are one."[165] On the other hand, however, intellect is not completely simple in the way that the First Cause is simple. The very fact that it possesses a cause suggests that it

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[160] Proclus (1963, 167,20–25)
[161] Badawī (1977a, Proposition 4, 6) and Taylor (1981, Proposition 4, 289, 10–13).
[162] Thillet and Oudaimah (2001–2002, Proposition 19).
[163] Endress (1973, 35–36 in the Arabic text, my translation).
[164] Badawī (1977a, Proposition 7).
[165] Badawī (1977a, Proposition 12, 15,2).

cannot be completely simple and that it contains multiplicity in its essence. Hence, the adaptors of *Maḥḍ al-khayr* and of *Liber II* seem to oscillate in their descriptions of the intellect, which is not simple when compared to the One, but whose various kinds of knowledge can nevertheless be subsumed under the knowledge it has of its essence.

The idea that the essence of intellect is characterized by multiplicity or complexity is found in al-Fārābī's metaphysics as well, although it is derived not from the Finitude-Infinity dichotomy that characterizes the Primal Intellect, but rather from the multiple objects of intellection of the subsequent intellectual beings. In al-Fārābī's cosmology, each separate intellect reflects on God and its own essence and therefore has a dual intellection. This duality prevents the intellects from being absolutely simple. As al-Fārābī says, "there is a multiplicity in the very being of each of them [the separate intellects], since anything that intellects some other given thing does itself, in a certain manner, become that other thing while simultaneously being its own proper self."[166] The intellects therefore initiate the process of variety and multiplicity in the metaphysical world, and this in spite of their immateriality. They are below the First Cause in the ontological hierarchy and are the first kinds of beings to possess some degree of multiplicity or complexity. Hence, with regard to the intellection and nature of the separate intellects, al-Fārābī is relying directly on some propositions of *Proclus arabus*.

But the parallels do not end here. A common feature in the Greek Proclus and the *Neoplatonica arabica* is the relation established between knowledge of the cause and of the self. This is a crucial concept for Proclus and many Neoplatonists, because it creates a noetical and causal link between the various metaphysical entities and implements the fundamental rule that the effect should be in a sense like the cause and the cause like the effect. In Proposition 167 of *Elements*, for instance, Proclus explains that each intellect knows itself and its prior cause, and that by knowing its prior cause, it knows its own essence.

The gist of this idea appears to have been conveyed by the Arabic adaptors and translators of Proclus. In Proposition 167 of *Proclus arabus*, one reads in respect to the intellectual beings: "if it knows what is above it, it also knows its own essence."[167] *Risālah fī l-ʿilm*

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[166] Al-Fārābī (1964, 40).

[167] Endress (1973, 35 of the Arabic text): *in ʿalima mā fawqahū ʿalima dhātahū ayḍan*.

al-ilāhī, a text derived from the *Plotinus arabus*, contains a similar passage, where the author argues that since the intellect knows God, Who is its cause, it must necessarily know itself as well. He writes: "If we concede to you that the intellect knows and desires God, may He be exalted, we concede also that when it knows Him it knows itself [*ʿalima dhātahū*]." And he adds shortly after: "If … we concede that the intellect knows God Almighty, then it knows His powers too. And if the intellect knows His powers, it knows itself."[168] *Maḥḍ al-khayr* makes a similar point with regard to the knowledge of the intellectual beings, but also extends this knowledge to the lower effects: "every intellect … knows what is below it, because it is a cause of it, and knows what is above it, because it acquires the virtues from it."[169] Finally, in an excerpt of *Proclus arabus*, the relation between knowledge of the self and of the effect is also clearly asserted: "As for the rest of the things endowed with knowledge [or science, *ʿilm*], each one of them knows its essence and knows what is above it [for this is also knowable]. I say that it knows what is above it and knows those things that are below it."[170]

The identity or connection between knowledge of the cause and of the essence is nowhere stated explicitly by al-Fārābī, who appears to have maintained a sharp distinction between these two kinds of knowledge.[171] His aim in doing so was perhaps to strengthen the duality of the intellects' contemplative activity, which not only distinguishes them from the perfectly unitary intellection of the First, but which is also used to explain how two different effects can proceed from these intellects. These distinctions would have been somewhat fuzzy if al-Fārābī had collapsed both types of knowledge (of the First and of the essence) into one.

In spite of this, we cannot completely exclude the possibility that al-Fārābī would have accepted the theory that by knowing their cause, i.e., God, the intellects know their essence, for nothing of what he says contradicts this view. Ibn Sīnā adopted it later on, arguing that each separate intellect can know its essence either in itself (as 'possible of existence') or through its cause (as 'necessary of existence'). But Ibn Sīnā developed in this respect a threefold model of intellection, while

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[168] Badawī (1977b, 172) and Lewis (1959, 309, translation revised).
[169] Taylor (1981, Proposition 7, 296, 1–5, translation slightly revised).
[170] Endress (1973, 35 of the Arabic text).
[171] See for instance al-Fārābī (1985a, 100 and 1985b, 61).

al-Fārābī adhered to a twofold model that does not hinge on the modal distinction between 'possible' and 'necessary' later made by Ibn Sīnā.

It should be noted that in al-Fārābī's system, unlike in that of Ibn Sīnā, each intellect does not contemplate the intellect located immediately above it, but rather the First Cause. This is slightly surprising, because according to al-Fārābī, each intellect is directly caused by the intellect above it, so that its proximate efficient cause is this prior intellect rather than the First Cause itself. Al-Fārābī's view could be explained by the propensity among monotheistic philosophers to emphasize the causal primacy of God to the detriment of the other metaphysical beings and to limit the causative role of these other beings. By making each intellect reflect on God rather than a higher intellect, al-Fārābī would be emphasizing that God is indeed the First Cause of all beings, even the ones located at a distance from His immediate emanation. But this theory is hard to reconcile with other aspects of his metaphysics, especially with the emphasis he places on the causative autonomy of the separate intellects (ch. 3, 2.6).

Al-Fārābī is more straightforward when it comes to knowledge of the essence and of the effect. Here one can be quite certain that he rejected any essential connection between the two. In *Siyāsah*, for instance, he writes that

> it is not part of their nature [the separate intellects'] to gain the splendour, beauty, and adornment of existence by contemplating anything existing below them, or anything that comes to be out of each of them, or anything that is consequential to the existence of each of the existing beings; none of that is associated with any one of them or inheres in any one of them.[172]

In *Ārāʾ*, al-Fārābī also states somewhat mysteriously that "what it [the first separate intellect] thinks of its own essence is no more than its essence."[173] The emphasis on the separate intellect's essence may serve to indicate that it does not acquire cognition of lower beings or of any other intelligible apart from the First. The radical detachment of the separate intellects from what lies beneath them seems appropriate to the mode of their intellection, which focuses on the unchanging and eternal principles that are the First and their own essence. Al-Fārābī's

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[172] Al-Fārābī (1964, 40) and McGinnis and Reisman (2007, translation slightly revised).

[173] Al-Fārābī (1985a, 100–101 and 1985b, 61).

restriction of the intellects' cognition to a higher principle is hardly surprising, given that he also rejects the idea of celestial imagination and the theory that the celestial souls know what lies beneath them. While his view is aligned with the doctrine of 'learned ignorance' or of 'an ignorance higher than knowledge' that one finds in *Theology of Aristotle* with regard to the principle of intellect, it on the other hand departs from the passages of *Proclus arabus* cited above.[174]

So far I have emphasized mostly the parallels between the *Neoplatonica arabica*, especially *Proclus arabus*, and al-Fārābī's theories of the *thawānī*. However, with regard to how intellection relates to actuality and potency, the Second Teacher is in complete disagreement with the Arabic Neoplatonic texts. In *Theology of Aristotle*, the adaptor argues that the higher mode of thought, that is, the mode of thought applicable to the incorporeal and intellectual entities, is potency, not actuality. As he writes, potency (*al-quwwah*) is, "in the high intellectual substances, that which manifests and perfects activity [*al-fiʿl*], whereas in the corporeal substances it is activity that perfects potency and brings it to the limit."[175] *Maḥḍ al-khayr* also articulates a similar idea, which can be traced back to several propositions of *Elements*, especially Propositions 78, 91, and 92, as well as to Plotinus' *Enneads*.[176] While the idea of a potency that surpasses actuality ultimately has its roots in these Greek works, the adaptors of *Theology of Aristotle* and *Maḥḍ al-khayr* were obviously keen to elaborate on it. In the context of Neoplatonic philosophy, *quwwah* is not meant to express Aristotle's concept of potentiality, but rather a power that transcends actuality and causes actuality in lower beings. For instance, the Intellect may be said to possess a potency or power that causes the actuality of the Soul.[177]

In contrast, al-Fārābī categorically rejects the idea of a potency or power (*quwwah*) that would transcend actuality. He follows Aristotle

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[174] For a discussion of 'learned ignorance' in *Theology of Aristotle*, see Adamson (2002a, 88 ff.).

[175] Badawī (1977b, 101) and Lewis (1959, 75, translation slightly revised). See also Adamson (2002a, 94 ff.). Cf. with Proclus' discussion of actuality and potency in Propositions 77–79 of *Elements*.

[176] See for instance *Enneads* 5.3.15, and for *Maḥḍ al-khayr*, Badawī (1977a, Proposition 4, 6–8, Proposition 8, 11–12 and passim).

[177] Adamson (2002a, 94–102). As Adamson notes, the Arabic term *quwwah* and the equivalent Greek term δύναμις should be translated as "power" rather than as "potentiality."

in holding that everything above the orb of the moon is in a state of constant and perfect actuality, and he contrasts this eternal actuality to the potency (in the sense of potentiality) of the sublunary existents. God, to begin with, is "actual intellect" (*ʿaql bi-l-fiʿl*).[178] The souls of the heavenly bodies are, for their part, "in no way and at no time in potentiality. On the contrary, they are always in actuality."[179] Finally, although al-Fārābī does not state this explicitly in his works, it is obvious that the separate intellects are in a state of complete actuality as well, since they are above the celestial souls in the hierarchy of being. In addition, like the First, they are immaterial and constantly actualized by their intellection. Their only deficiency derives from their having multiple objects of thought. Al-Fārābī thus restricts potency to the corporeal world, especially to sublunary matter. On this particular issue he follows Aristotle and the Peripatetic tradition rather than the *Neoplatonica arabica*.

2.4. *The Special Case of the Agent Intellect*

I shall not concern myself here with the Greek antecedents to the theory of the Agent Intellect, or with the unique role that this intellect plays in the processes of sublunary change and human intellection. These topics have already been discussed quite extensively by H. A. Davidson and other scholars and could very well form the subject matter of a new monographic study.[180] Rather, I wish merely to highlight some of the most striking features of the Agent Intellect in the superlunary context, as well as the discrepancies between it and the other separate intellects, because these features have not been sufficiently emphasized in the modern literature.

To begin with, the Agent Intellect is distinguished by having a threefold intellection, instead of a twofold intellection like the *thawānī*. As al-Fārābī explains in *Siyāsah*: "As for the Agent Intellect, it contemplates the First, all the *thawānī*, and its own essence."[181] Hence, in terms of the

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[178] Al-Fārābī (1985a, 70–71 and 1985b, 46–47).

[179] Al-Fārābī (1964, 34).

[180] The scholarship on the Agent Intellect in al-Fārābī's philosophy is broad and includes among other works: Finnegan (1957), Rahman (1958), Walzer (1974), Lucchetta (in al-Fārābī 1974) Davidson (1972 and 1992), Hamzah (in al-Fārābī 2001b), Geoffroy (2002), and Vallat ("L'intellect selon Fārābī: la transformation du savoir en être," forthcoming).

[181] Al-Fārābī (1964, 34): *wa-ammā l-ʿaql al-faʿʿāl fa-innahū yaʿqilu l-awwal wa-l-thawānī kullahā wa-yaʿqilu dhātahū*.

structure of its intellection, the Agent Intellect is comparable to the celestial souls, whose contemplation encompasses three different kinds of intelligibles. There is, however, an important difference. Whereas each celestial soul contemplates only the separate intellect to which it owes its existence, the Agent Intellect apprehends all the prior intellects in one sweep (*wa-l-thawānī kullahā*). The conclusion is that the Agent Intellect has a unique kind of intellection, which sets it apart from that of the other separate intellects and the celestial souls.

Al-Fārābī does not explain why the Agent Intellect is unique, nor is there any particular reason that could immediately justify this fact. However, at least one hypothesis can be advanced. According to the Second Teacher, the separate intellects and heavenly bodies are organized hierarchically with respect to their nobility, which itself depends on their causal proximity to the First. The Agent Intellect is the tenth separate intellect and lies below the nine *thawānī*, although it is higher in rank than the celestial bodies. As a result of its lower rank and its remoteness from the First, it does not produce another separate intellect and an orb, but instead governs the sublunary world. This is the most conspicuous difference between the Agent Intellect and the *thawānī*. Now, the separate intellects are alike in that they are all immaterial and intellectual beings, so that the substance of the Agent Intellect is really the same as that of the *thawānī*. Their only deficiency lies in their having various objects of intellection, which causes a certain multiplicity to exist in them. Hence, it is at this level only that al-Fārābī can establish a distinction between these intellects and justify the fact that the Agent Intellect is the last and lowest in the series. This he does by ascribing a threefold intellection to the Agent Intellect, thus setting it apart from the *thawānī*, which only have a twofold intellection. This threefold intellection means that the Agent Intellect has a lower status than the *thawānī*, because it possesses a higher degree of multiplicity. It is this greater degree of multiplicity attached to its threefold intellection that can best account for its special status and for the fact that it cannot emanate another separate intellect.[182]

There is, however, another peculiar feature about the threefold intellection of the Agent Intellect. Not only does it mirror that of the celestial souls, but it can also be compared to the activity of the human intellect, which in al-Fārābī's noetics possesses three stages: potential,

[182] Yet al-Fārābī gives no compelling explanation as to why the Agent Intellect is the tenth intellect and why the series of intellects cannot continue beyond this number.

active, and acquired. The parallel between these three human noetical stages and the three objects of thought reflected upon by the Agent Intellect is strengthened by the fact that the Agent Intellect is responsible for the actualization of the human intellect. It is thanks to the Agent Intellect that human beings can reach the state of the acquired intellect. In this connection, al-Fārābī writes that the Agent Intellect "belongs to the same species as the acquired intellect" in humans (*wa-l-ʿaql al-faʿʿāl huwa min nawʿ al-ʿaql al-mustafād*).[183] This statement is at first glance surprising, because the celestial souls are said in another passage to belong to a different species from the human intellect, and so *a fortiori* the separate intellects should be even more different from the human intellect.[184] But in light of the role of the Agent Intellect in human cognition and in the actualization of human knowledge, it is understandable that al-Fārābī would want to stress the kinship between them. Hence, the unique status and mode of contemplation of the Agent Intellect can also be explained in terms of its function in actualizing the human rational soul, which both possess a tripartite structure. If the Agent Intellect were radically different from the human intellect, then our capacity to acquire knowledge would become difficult to explain.

This suggests that al-Fārābī probably intended to model his cosmology closely on his psychology. He elaborates a celestial noetics that is in many respects symmetrical to his theories of human noetics. Thanks to the previous analysis, it is easier to understand why al-Fārābī in *Siyāsah* lists the Agent Intellect as a principle that is distinct from the other separate intellects (*thawānī*).[185] Although all of these beings share a common immaterial and intellectual essence, the Agent Intellect nevertheless fulfills a unique epistemological function in al-Fārābī's cosmology, which is implied by the structural parallel between its mode of functioning and the human mind.

2.5. *Intellect and Form*

One of the salient features of al-Fārābī's theory of the celestial souls is his claim that they can be identified with celestial forms (*ṣuwar*). The heavenly bodies are "like" sublunary beings in that they have a substrate, and they are also "like" them in that they possess a form, which

[183] Al-Fārābī (1938, 27) and McGinnis and Reisman (2007, 75).
[184] Al-Fārābī (1964, 33).
[185] Al-Fārābī (1964, 31).

for al-Fārābī is their soul (*nafs*).[186] Unlike sublunary substrates, however, which can receive a variety of forms, the heavenly bodies only ever possess one single irreplaceable form. Yet the mention of form in a superlunary context is somewhat problematic, since according to al-Fārābī's physics, form always inheres in matter. This problem is compounded by his frequent claim that the celestial souls are essentially intellects, thus making this identification even more puzzling. To what extent should the equation between form and intellect be taken literally? And can the concept of form be extended to the separate intellects as well? In order to answer these questions, it is necessary to examine al-Fārābī's views on the separability of form.

The passages in the Fārābīan corpus dealing with the question of the separability of form display many tensions. On the one hand, al-Fārābī is quite clear that form and matter are principles that pertain to the sublunary world alone, and thus one assumes that they have no place in the heavens. He explains that form cannot exist without matter and must inevitably inhere in a material substrate. In talking about the First Cause in *Ārāʾ*, for example, al-Fārābī asserts that it does not have form, "because form can exist only in matter."[187] In *Siyāsah*, al-Fārābī writes "that forms do not subsist by themselves, as they need a subject in order to exist, and their subject is matter."[188] In another passage, al-Fārābī distinguishes between the forms that inhere in the matter of concrete objects, which he calls *ṣuwar*, and the forms that enter the various faculties of the human soul as a result of abstraction, which he calls "imprints" (*rusūm*). He then adds that although these imprints are "like forms in matters, they are definitely not called forms, except in an analogical manner [*illā ʿalā sabīl al-tashbīh*]." Also significant is al-Fārābī's statement that the imprints of the intelligibles are "most unlike forms"

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[186] Al-Kindī and Abū Sulaymān al-Sijistānī (d. 985 CE) also upheld the doctrine of the ensoulment of the orbs. Al-Sijistānī, like al-Fārābī, equates superlunary soul and form. In his treatise entitled *Maqālah fī anna l-ajrām al-ʿulwiyyah dhawāt anfus nāṭiqah*, al-Sijistānī (1974a, 370, my translation) asserts that "the soul [of the celestial bodies], which is their form, move them through volition" (*fa-l-nafs, allatī hiya ṣūratuhā, tuḥarrikuhā bi-l-irādah*). It is not possible to know whether al-Sijistānī derived the equation between form and soul from al-Fārābī's works or from another text which would have served as a common source, such as Alexander's *Mabādiʾ*. At any rate, it shows that the identity between soul and form in a cosmological context was widespread among Baghdad philosophers.

[187] Al-Fārābī (1985a, 59 and 1985b, 38).

[188] Al-Fārābī (1964, 36–37): *fa-inna l-ṣuwar laysa lahā qiwām bi-dhawātihā wa-hiya muḥtājah ilā an takūna mawjūdah fī mawḍūʿ*.

and that "in the case of the actual intellect's becoming like the Agent Intellect, the intellect is not a form nor even *like* a form." He concludes that it is only by homonymy (*ishtirāk*) that one may call the human intellect a form in this case.[189] What this shows is that the human intellect and *a fortiori* the two classes of celestial intellects are not forms *stricto sensu*, but rather can be called forms in a homonymous manner. These passages from *Siyāsah* argue clearly that form can only truly exist when it is embedded in material substrates.

On the other hand, *Fī l-ʿaql* unambiguously posits the existence of immaterial forms. At one point, al-Fārābī writes: "In the case of existing things that are forms that neither *are* in matters nor *were ever* in matters."[190] The possibility that forms can exist without an accompanying matter is also asserted in another passage: "What Aristotle calls the 'Agent Intellect' in Book 3 of *On the Soul* is *a separate form* [*ṣūrah mufāriqah*] that has never been and never will be in matter."[191] Al-Fārābī defends the existence of separate forms in some of his other works, as in *Jamʿ*, whose authenticity, it should be stressed, is problematic. In this work he refers to the authority of *Theology of Aristotle* to argue that Aristotle agrees with Plato in positing spiritual forms (*ṣuwar rūḥāniyyah*) devoid of matter, although these are said to subsist in the divine essence.[192] In *Falsafat Arisṭūṭālīs*, he also describes the Agent Intellect as "a separate form of man."[193] Although he does not mention any Neoplatonic text by name, it is clear that material from the *Neoplatonica arabica* is lurking in the background, as the theory of separate forms is a salient trait of this corpus.[194] Hence, according to certain works by

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[189] Al-Fārābī (1964, 37–38) and McGinnis and Reisman (2007, 85, translation slightly revised).

[190] Al-Fārābī (1938, 20) and McGinnis and Reisman (2007, 73): *fa-idhā kānat hāhunā mawjūdāt hiya ṣuwar lā fī mawādd wa-lam takun qaṭṭu ṣuwaran fī mawādd*.

[191] Al-Fārābī (1938, 24) and McGinnis and Reisman (2007, 74, translation revised): *wa-l-ʿaql al-faʿʿāl alladhī dhakarahū Arisṭāṭālīs fī l-maqālah al-thālithah min kitāb al-nafs huwa ṣūrah mufāriqah lam takun fī l-māddah wa-lā takūnu aṣlan*.

[192] Al-Fārābī (1999e, sec. 66, 142–145).

[193] Al-Fārābī (2001c, 127).

[194] See for example the excerpts of *Proclus arabus* in Endress (1973, 12–21), many of which aim to prove the existence of spiritual forms (*ṣuwar rūḥāniyyah*). As Adamson (2002a, 140) notes, form plays an important role in the ontology of *Theology of Aristotle* and is sometimes used to refer to the intelligible world of soul and intellect; see Badawī (1977b, 163) and Lewis (1959, 395) for the statement that God first originated form (*ṣūrah*) and then created the intellects and souls "through the mediation of this form" (*bi-tawassuṭ tilka l-ṣūrah*); see also Lewis (1959, 207, 281) for *Theology of Aristotle* and *Sayings of the Greek Sage*, and Endress (1973, 12–21) for the *Proclus arabus*. In the early Arabic tradition, immaterial and intelligible forms are also a hallmark of

al-Fārābī, the Agent Intellect as well as the universals subsisting in God's essence can be defined as immaterial forms. Just as form expresses essence in the sublunary world, it would seem that the essence of the superlunary intellects is also reducible to form. Interestingly, the overlap between the two concepts of form and intellect is observable both in al-Fārābī's celestial and human noetics.[195]

How should one reconcile al-Fārābī's various statements on the separability of form? Did his views on this topic change over a period of time? This is a likely hypothesis, since the works in which al-Fārābī clearly rejects the existence of separate forms, namely, *Ārāʾ* and *Siyāsah*, were composed at the end of his life. In contrast, the works in which he endorses this theory, such as *Jamʿ* and *Falsafat Aristūṭālīs*, are presumably earlier compositions. Moreover, the presence of a specific analogical terminology in the emanationist treatises with regard to how forms relate to the superlunary entities suggests a certain development in al-Fārābī's reflection on this point. In these works, he compares the celestial soul to form, but nowhere does he establish a strict identity between the two. The celestial soul is "like" form and "resembles" form. This analogical language, or language of similarity, suggests that al-Fārābī did not conceive of the celestial souls as forms *stricto sensu* and that he merely used this comparison to facilitate the reader's grasp of the nature of the celestial beings. As for the separate intellects, nowhere are they identified with forms in the manner stated in *Falsafat Aristūṭālīs*. Hence, this variegated evidence definitely raises the possibility of an evolution in al-Fārābī's conception of how soul and intellect relate to the concept of form. This developmentalist hypothesis will be further explored at a later stage, but for the time being I wish to complete the structural overview of al-Fārābī's

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the Pseudo-Empedoclean and Ismāʿīlī currents, which made extensive use of works such as *Theology of Aristotle*. Sometimes, form is said to be the first thing created by God and the principle that subsequently fashions the universe; see Altmann and Stern (1958), Jolivet (1995), De Smet (1995, 219 and 1998). Although al-Fārābī does not adhere to these metaphysical theories, it is not unreasonable to speculate that he may have been influenced by the emphasis they place on form.

[195] In his discussion of the human intellectual faculties in *Fī l-ʿaql* (1938, 22), al-Fārābī explains that each level of the human intellect may be conceived of as "form" for the intellect below it and as "substrate" for the intellect above it. Like substrate, form is a concept that appears both in al-Fārābī's cosmology and noetics, and one which is used to describe the various faculties of the intellect. Walzer's conclusion (in al-Fārābī 1985a, 336) that "the separate intellects are then, in his [al-Fārābī's] view, without forms as well," is therefore not valid if one takes into account *Fī l-ʿaql*.

cosmology by turning to the highest metaphysical entity, namely, God or the First.

3. *The First (al-awwal)*

The terms al-Fārābī uses most frequently to describe God are 'the First' (*al-awwal*) and 'the First Cause' (*al-sabab al-awwal*). These two expressions refer to God's essential priority in existence over all the other entities and to His causing the lower effects out of His own essence. It should be said from the outset, however, that the mode in which the First causes the universe to exist is an ambiguous topic in al-Fārābī's cosmology and has divided scholarly opinion for some time. To begin with, al-Fārābī presents different accounts of creation in his works. In some treatises attributed to him, notably *Jamʿ* and *Jawābāt*, he seems to adhere to a creationist position, according to which God created the whole world *ex nihilo*, all at once, and together with time and will destroy it at some point in the future. But in other works, and especially in his emanationist treatises, the First is said to act as an eternal cause of the world's existence, the world itself having neither beginning nor end. Even his emanationist treatises are not devoid of ambiguity, as al-Fārābī limits God's causation to a single effect (the first separate intellect) and also endows the separate intellects (*thawānī*) with the capacity to bring other beings into existence on their own and through their own powers. This raises the questions of how the First differs in its creative activity from the other separate intellects, and of whether creationism—in the sense of there being a unique Creator-God responsible for the world's existence—has any relevance at all in al-Fārābī's philosophy (ch. 3, 2.6).

With regard to al-Fārābī's 'theology' or his views on God's existence and essence, only few statements can unambiguously and positively be made.[196] The First is a substance (*jawhar*), which is eternal (*azalī*), autonomous, non-hylomorphic and of an intellectual nature, and in essence one and simple (*wāḥid* and *basīṭ*). An important feature stressed by al-Fārābī is the identity between intellect and the divine essence. Since the First is immaterial, It must necessarily be an intellect (*ʿaql*),

[196] The following discussion is based chiefly on the first section of *Ārāʾ* (al-Fārābī 1985a, 56–89 and 1985b, 37–55), which is al-Fārābī's most systematic treatment of theology.

as al-Fārābī considers all immaterial beings to be of an intellectual nature. More specifically, however, It is a perfect intellect that is not affected by any kind of deficiency (*naqṣ*) and plurality or complexity (*kathrah*), and which thus possesses a unitary and perfectly simple intellectual existence. It may be described as pure reason or as thought itself, and in that sense it is the originative source to which all rational beings seek to return.

The First is not only an intellect (*ʿaql*), but in addition the highest intelligible (*maʿqūl*), which means that It is both thought and object of thought at the same time. It is, first and foremost, an object of thought for Itself, which means that It is constantly engaged in the act of contemplating Its own essence. In the case of the First, however, this self-reflexivity does not lead to multiplicity, as thought and object of thought is one and the same thing. Not only is It the unique object of thought of its own contemplation, it also represents the highest and most universal intelligible for the other rational beings of al-Fārābī's cosmology, the *thawānī*, the celestial bodies, and, finally, human beings. In equating God and intellect or pure thought, al-Fārābī is following a long Peripatetic tradition that has its starting point in *Metaphysics* 12.9.1074b.34–35. In this passage, Aristotle defines the First Unmoved Mover as "thought thinking thought," a formula which the Second Teacher reproduces in *Ārāʾ*, thereby showing his adherence to this fundamental Aristotelian tenet.[197]

In addition to being pure thought or intellect, the First is also described as the highest existent (*mawjūd*) and as the cause of existence (*wujūd*) in all the other beings. In conceiving of the highest divinity in such a way, al-Fārābī departs from the Greek Neoplatonic tradition, which had placed the One above the concept of existence and all positive predication. On the other hand he seems to follow the *Neoplatonica arabica*, which describe the First as possessing existence (*anniyyah*) and as a cause of existence for the lower beings.[198] This would seem to imply that all the other entities, whether immaterial or

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[197] Al-Fārābī (1985a, 70–71 and 1985b, 47). On the other hand, al-Kindī resisted this identification; see Adamson (2007a, 72).

[198] See Propositions 2, 4, and the end of Proposition 8 of *Maḥḍ al-khayr* in Badawī (1977a) and Taylor (1981), as well as Adamson (2002a, 124 ff.) for *Theology of Aristotle*. With regard to the One's relation to intellect, however, *Maḥḍ al-khayr* seems quite faithful to the Greek texts. See Proposition 8: "and the First Cause is not an intellect, nor a soul, nor a nature, but rather It is above the intellect" (Taylor 1981, 299, translation slightly revised).

material, and regardless of how far removed they are from the direct causation of the First, ultimately owe their own existence to It.

This picture, together with the notions of emanationism and the 'commonality of being' it implies, is nevertheless difficult to reconcile with other statements by al-Fārābī. For unlike the *Neoplatonica arabica*, al-Fārābī does not describe the First as 'pure being' (*anniyyah faqaṭ*), but rather as a unique existent, "different in its substance from everything else," whose special existence is not shared by any other entities.[199] In that sense, it should be stressed that the immaterial world of the intellectual entities is eternal and above time, which means that these entities have always existed and have always possessed their particular and autonomous existence, even though they require a cause for their substance to be actualized and fully perfected. In addition, al-Fārābī explains clearly that the First's intellection gives rise to a single effect, and not to the entire universe, and that it is the other separate intellects that are responsible for causing the rest of the existents.

In view of this, al-Fārābī's occasional statements that the First is a cause of existence for all the other beings is highly ambiguous and may perhaps be construed as a concession to the religious creationist paradigm of his day. Alternatively, and more likely in my view, it represents a remnant of his early creationist phase, which was not fully reconciled with his mature theory of secondary causation. As a result, it stands awkwardly alongside his parallel account of the causation of the separate intellects, whose activity, together with the crucial issue of mediation (*tawassuṭ*), will be explored in depth in chapter 3.

At any rate, al-Fārābī's doctrine of the First appears to be grounded in, and a synthesis of, two main sources: Aristotle's *Metaphysics*, Book Lambda 9, and the *Neoplatonica arabica*. It is the combination of these sources, which were in wide circulation in tenth-century Baghdad, which can best explain his particular view of the First as pure thought and as the highest existent and cause of existence. In the First, then, existence and thought is one and the same thing. Since It is nothing else but an immaterial intellect, its existence is identical to its thought, and it exists only in or through its thinking. This also helps to explain the particular way in which the First Cause induces existence in the

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[199] Al-Fārābī (1985a, 58–59 and 1985b, 38–39). For a discussion of the concept of pure being in *Theology of Aristotle*, see Adamson (2002a, 124 ff.). For a discussion of existence (*mawjūd*/*wujūd*) and al-Fārābī's original contribution to this topic, especially in his *K. al-ḥurūf*, see Menn (2008).

first effect. Although al-Fārābī is silent on this issue, one may conclude that its causation operates solely through its intellection. Since Its intellection is wholly unitary and simple, the First can only give rise to a single being, i.e., the first separate intellect.

Furthermore, al-Fārābī insists repeatedly on the notions of divine oneness and unity (*waḥdah*) and frequently asserts that God is one (*wāḥid*); in fact, God is *the* One (*al-wāḥid*). The underlying idea is that were the First Cause not a perfectly simple being, it would require a cause prior to it in existence to account for its compositeness and thus would not be the First. It is noteworthy that al-Fārābī stresses two related yet distinct concepts with respect to God's essence: first, God's simplicity, that is, the idea that God's essence is not in any way composite, composed, or complex, but rather simple (*basīṭ*); and second, God's unicity and oneness, that is, the idea that another being as simple as God cannot exist alongside God.[200]

It is interesting to note that the conclusion regarding God's oneness or unicity is deduced from the concept of divine simplicity. If, al-Fārābī argues, another being is posited whose substance is like God's, i.e., perfectly simple, then both beings would be similar in one respect and different in another. As a result, a pre-existing cause would have to be posited to account for this differentia, which means that neither would be the First.[201] It is *because* God is the only being to have a perfectly simple essence that He does not require a cause and is prior to all other beings. As the only simple being, God is the First Cause of all things, whose substances are in contrast composite and thus deficient and derivative. The concepts of God's simplicity and priority explain why, according to al-Fārābī, there cannot be a definition of the First, since a definition requires a division of the subject's substance.[202]

Intellection, existence, simplicity, and oneness are therefore the foundational concepts of al-Fārābī's theology. They are the most significant positive and assertoric statements that can be made with regard to the First. In *Ārāʾ* and *Siyāsah*, the Second Teacher enumerates many other qualities and attributes, such as justice, wisdom, knowledge,

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[200] The First's simplicity is also stressed by *Maḥḍ al-khayr* in Proposition 20: "It is simple (*basīṭ*) to the utmost degree of simplicity" (Taylor 1981, 317, translation slightly revised). It is interesting that al-Fārābī follows the *Proclus arabus* in distinguishing between these two aspects of unity.

[201] Al-Fārābī (1985a, 59 ff. and 1985b, 38 ff.).

[202] Al-Fārābī (1985a, 66 and 1985b, 44).

beauty, etc., which can be applied to God.[203] But al-Fārābī is prompt to warn his readership that these terms do not refer to something distinct within, or apart from, the divine essence. While they apply to the First in a prior and primary way, they are inadequate to express Its true essence and can only be predicated of the First in a homonymous manner and in relation to things in this world.[204] Since some of these terms correspond to the divine attributes used in Islamic theology, there can be little doubt that al-Fārābī is deliberately alluding to contemporary theological issues in these passages, and more specifically to the question of how God's attributes relate to His essence. Indeed, this question had turned into a widespread debate by the time al-Fārābī appeared on the scene, and it was one of the main causes of doctrinal division among the theologians of his time.[205]

Al-Fārābī's laconic style makes it particularly difficult to reconstruct his views regarding the question of God's knowledge, which should nonetheless be addressed briefly. Again in this case, knowledge (*ʿilm*) is not to be conceived of as something distinct from the First's essence, but rather as being identical with Its thought and existence. But what is the First thinking about, and what does Its knowledge consist in? Unlike in the case of the celestial souls and intellects, al-Fārābī

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[203] For a list of the other epithets applied to the First, such as *ḥaqq*, *ḥayy*, *ḥakīm*, etc., see al-Fārābī (1985a, 72–75, 1985b, 46–49, and 1964, 49–51). Interestingly, the term *Allāh* is virtually absent from al-Fārābī's metaphysical treatises. This says a lot about the Second Teacher's philosophical project, which was aimed more at continuing the Greek tradition of reflection on the principles (ἀρχαί/*mabādiʾ*) and causes (αἰτίαι/*asbāb*/*ʿilal)* of the universe, than at creating a system of thought compatible with the Islamic revelation.

[204] This explains why some homonymous terms may be ascribed chronologically first to things in this world and then to the First, although they apply to the First in a prior sense. Al-Fārābī's position clearly relies on the concept of analogy (*qiyās*) (see al-Fārābī 1985a, 84 and 1985b, 53), although his short remarks make it difficult to determine what role this concept plays in this context and how it relates to contemporary *kalām* conceptions.

[205] Al-Fārābī, whose sensitivity to the issue of divine unity must have been stimulated by these theological developments as well as by his philosophical training with Christian scholars, clearly marks his stance vis-à-vis this thorny problem. Not only does he reject the attribution of physical or anthropomorphic features to God, but in addition he holds a unitary theory of the divine essence that excludes the existence of attributes that would be distinct from God's essence and co-eternal with it. While his view bears a striking resemblance to the Muʿtazilite position, as Walzer (in al-Fārābī 1985a, 346–348) and especially Rudolph (2007) have shown, this connection can only be regarded as relative, given that al-Fārābī upholds other metaphysical theses that would have been unacceptable to this theological group, in particular his views on the causative activity of the intellects and his rejection of atomism.

does not elaborate on the objects of divine thought beyond the mere statement that the First thinks Its own essence and therefore that It is pure intellect (*ʿaql*) and intelligible (*maʿqūl*). Yet in *Siyāsah*, he adds that

> the First contemplates Itself, which, in a certain way, is all of the existents [*al-mawjūdāt kulluhā*]; for when It intellects Itself, It intellects, in a certain way, all of the existents, because It is only out of Its existence that every other existent receives its existence.[206]

This tantalizing statement leaves ample room for speculation about al-Fārābī's position on this issue and raises more questions than it solves. To begin with, one wonders whether al-Fārābī intended this statement literally, or whether it should not rather be construed as a concession made to the theologians and the traditionalists. Its tenor and phrasing at any rate could point in this direction. But assuming that al-Fārābī sincerely intended this statement, other questions arise. Does the First apprehend universals only or also particular things? Are we to understand al-Fārābī's statement as referring to the presence of forms in the divine intellect, by which or through which the First knows all things? And how can the First be said to be absolutely simple, if It in a certain way comprises all things? Would not the very act of beholding different essences or particulars lead to multiplicity in the divine essence?

Needless to say, al-Fārābī does not address these questions in detail in *Siyāsah* or in his other extant works. But as ambiguous as it is, this statement could represent an important piece of evidence for his adherence to a particular doctrine of divine omniscience derived from the ancient commentatorial tradition. Indeed, some of the late antique philosophers had not only defined Aristotle's God as pure thought, but also argued that the objects of His intellection consist of various intelligibles contained in the divine essence. One strategy was to apply to the Aristotelian God some of the (Neo-)Platonic doctrines on the forms and intellect, as exemplified by Ammonius, who seems to have located the forms in the divine intellect, a move which in turn helped him to argue in a treatise written to this effect that the Aristotelian God is also

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[206] Al-Fārābī (1964, 34) and McGinnis and Reisman (2007, 83). In making God cognizant of all the effects that derive from His essence, it is possible that al-Fārābī is following Themistius' interpretation of Aristotle's Prime Mover in his paraphrase of Book Lambda; see Brague (in Themistius 1999, 37–38).

the efficient cause of the world.[207] Al-Fārābī presumably knew at least excerpts from Ammonius' treatise, as well as some of the late antique writings on Book Lambda 9, especially Themistius' paraphrase and possibly Syrianus' commentary, all of which were translated into Arabic. According to the remaining Arabic and Hebrew fragments of Themistius' paraphrase, God contemplates the intelligibles contained in His essence and through them knows all things. As he writes: "And so it has become clear from the foregoing that God is the First Principle [*al-mabdaʾ l-awwal*] and that He knows His essence and all the things [*jamīʿ al-ashyāʾ*] for which He is a cause." And also: "The First Intellect [God] contemplates all the intelligibles together [*jamīʿ al-maʿqūlāt maʿan*] when It contemplates Its own essence."[208] Hence, by existing as the First Cause of the entire universe and by encompassing all the forms of the things that come to be, the First would know all the effects that derive from Its essence, be they several times removed from It.[209]

It is possible that al-Fārābī had Themistius' paraphrase in mind when writing this passage of *Siyāsah* and that he followed his Greek predecessor in including the universal intelligibles in the divine essence. Since its phrasing is ambiguous, one might even be tempted on the basis of this statement to extend the First's knowledge to all the particulars of the sublunary world. Although Its knowledge of all effects is atemporal, since Its causality operates beyond time, the concatenation triggered by the First eventually enters the temporal realm and results in the historical events human beings are involved in. God would accordingly know the effects of past, present, and future events, which in contrast to the divine knowledge unfold linearly in historical time. This is the view articulated in some of al-Fārābī's other writings, such as *Jamʿ* and *K. al-ʿibārah*, which describe explicitly God's knowledge of

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[207] See Sorabji ("Introduction" in Philoponus 1987, 8). Ammonius' treatise is mentioned by Ibn al-Nadīm (1970, vol. 2, 610) in *Fihrist* under the title *Exposition of Aristotle's Doctrines about the Creator*. For the reception of this work in the Greek-Arabic background, see Mahdi (1967), Verrycken (1990a), Bertolacci (2005a), and D'Ancona (2006).

[208] See Badawī (1947, 21, my translation) and Brague (in Themistius 1999, 37), who suggests that this view relies on some of Plotinus' comments on intellect in *Enneads*. See also Pines (1987), who discusses the impact of Themistius' theory on Arabic intellectual history, although the author says nothing about al-Fārābī.

[209] It is unclear whether according to Themistius, or rather according to the preserved Arabic and Hebrew versions of his text, the knowledge of the First Principle consists of universals alone or also includes particular things. By being at the beginning of the causal chain, the First could know what lies at its end. However, in the absence of specific statements to this effect, the first option seems more likely.

particulars.[210] Alternatively, there is also the possibility that the First would know all the particulars "in a universal way" (*ʿalā naḥw kullī*), as Ibn Sīnā would say.[211]

While possible, these readings of the *Siyāsah* passage require an interpretive leap. Nowhere in his emanationist works does al-Fārābī intimate that God's knowledge of all effects *qua* First Cause includes knowledge of the transient, particular things of the sublunary world. Nor is there any support for the view that God knows particulars in a universal way, which seems idiosyncratic to Ibn Sīnā. Moreover, one aphorism in *Fuṣūl* that addresses this question expressly seems to decisively reject the possibility of divine knowledge of particulars. In this passage, al-Fārābī discusses three possible views concerning divine knowledge. The first one is that the First knows only Its essence (*dhātihī*). This position obviously harks back to Aristotle's comments in *Metaphysics* Book Lambda 9 on the self-reflexivity of divine thought. According to the second view, God knows "all universal intelligibles" (*al-maʿqūlāt al-kulliyyah kullahā*) instantly and through non-discursive thought (*dafʿatan*), a position indebted to Platonic and Neoplatonic theories on intellect and to the late antique commentatorial tradition on Book Lambda. Finally, the third view claims that God knows "all of the sense-perceptible particulars" (*al-juzʾiyyāt al-maḥsūsah kullahā*).[212] Al-Fārābī vehemently refutes this third option at the end of the aphorism, which, although it is not stated, is clearly the one defended by most *mutakallimūn*.

While this is straightforward, there are no other hints to help us decide which of the first two views al-Fārābī adhered to. The second one can be compared to the key statement in *Siyāsah* cited above, and it seems also to be the one implicitly upheld by Themistius in his paraphrase of Book Lambda 9. It could very well be, then, that al-Fārābī believed that God's knowledge encompasses the universal principles, such as the forms or mathematical axioms, which was the view

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[210] An interpretation as to why these texts uphold such a view will be given in chapter 3. Here I focus mainly on the emanationist works.

[211] Ibn Sīnā (2005, 288,4), who writes in *Metaphysics* of *Shifāʾ*: "the Necessary Existent apprehends intellectually all things in a universal way; yet, despite this, no individual thing escapes His knowledge. … As for the manner of this, it [takes place] because, when He intellectually apprehends His essence and apprehends that He is the principle of every existent, He apprehends the principles of the existents [that proceed] from Him and what is generated by them." See also Marmura (1962).

[212] Al-Fārābī (1971b, 89–90 and 2001a, 55–56).

defended by some Greek Neoplatonists in their attempt to provide a harmonizing account of Plato's and Aristotle's philosophies. However, even this restricted interpretation runs into difficulty, as al-Fārābī does not make a cause's knowledge of its effects a condition for the existence of these effects. For instance, he believes that neither the separate intellects nor the celestial souls are cognizant of the things that lie beneath them, although they are causes for the existence of these things. Hence, it would be surprising if the First was cognizant of what lies beneath It. Indeed, al-Fārābī seems eager to remove the immaterial principles from any connection—be it purely cognitive—with their effects and with the beings situated below them in the cosmological hierarchy. Al-Fārābī's minimalist account of the intellection of the celestial souls and separate intellects seem to favour the first view exposed in *Fuṣūl*, i.e., that the First thinks only Its essence. This interpretation also seems supported by the fact that in his longest and most systematic account of the First, which can be found in *Ārāʾ*, al-Fārābī says nothing concerning Its knowledge of other intelligibles apart from Itself, and he seems to faithfully follow Aristotle's proposition of divine self-reflexivity.

But if this interpretation is correct, then it would raise a host of problems, since al-Fārābī, unlike Aristotle, clearly defines the First as an efficient cause. If the First's thought is limited to Its own essence, and if It is supposed to cause the existence of other things through Its intellection and knowledge, then how can it cause something else to exist apart from Its own self? Although the problem of how multiplicity can arise from unity characterizes the entire Neoplatonic metaphysical program, it manifests itself in a particularly sharp form in al-Fārābī's philosophy, due to the purely intellectual nature of the First. It would seem that al-Fārābī's doctrine in this respect presents a real ambiguity, which may be encapsulated in the following dilemma: either a) the First knows all things, with the implication that whatever comes into existence is an effect of Its contemplation and knowledge of that thing, or b) Its knowledge is restricted solely to Its own essence, in which case causation of other existents would not be possible. Unfortunately, al-Fārābī does not provide us with any satisfactory explanation of this problem. In the absence of further evidence, it seems unwise to put forth a definitive conclusion concerning al-Fārābī's views on divine knowledge.[213]

[213] I am not sure to which extent the slightly divergent proposition to a) given above, i.e., that whatever the First contemplates or reflects upon must *necessarily* come into existence, is true in al-Fārābī's philosophy. Apart from the single piece of evidence in

Putting this question aside, I wish to end this section with some remarks on how the First Cause fits in al-Fārābī's cosmological model, especially with regard to its relation to the orbs and its role in celestial motion. In Aristotle's cosmology, the First Unmoved Mover is responsible for causing the motion of the outermost heaven, and in this respect it does not differ from the other unmoved movers whose task it is to move the lower orbs.[214] According to al-Fārābī, in contrast, God is a universal mover and a final cause responsible for the motion of the entire heaven, while the outermost orb is moved directly by the first separate intellect. God moves the heavens as "the first object of love" (*al-maḥbūb al-awwal*) and is the highest intelligible contemplated by the various celestial intellects.[215] In that sense, the First Cause is unlike the other intellects, which are each associated with one main orb and which act as a final cause for this orb specifically. The increased isolation of the First Cause and the introduction of an intermediary intellect between it and the first heaven are key features of al-Fārābī's cosmology. It marks a significant departure from Aristotle, and also argues in favour of a profound Neoplatonic influence on the Second Master. Indeed, the First Cause becomes more akin to the One of the Neoplatonists, especially since it causes a single, intellectual being in a way reminiscent of how the One causes the Intellectual Principle. Yet al-Fārābī's First also retains the kinematic function that Aristotle had ascribed to the unmoved movers, i.e., their capacity to move the heavens as final causes, thereby making his doctrine a subtle compromise between these two positions. All in all, then, al-Fārābī's theological doctrines regarding the essence, activity, and place of the First in his cosmology are similar to his other doctrines on soul and intellect in that they display a thorough and well-thought out combination of Aristotelian and Neoplatonic material, creatively reworked and recast in a new form.

Siyāsah that what the First "intellects [is], in a certain way, all of the existents," nothing would validate such a view. The statement from *Siyāsah* is furthermore problematic insofar as it does not seem to square comfortably with al-Fārābī's general views on the causation of the intellects as described in this same work. Indeed, the main impression one gets from reading the various pages al-Fārābī devotes to these entities is that their causative activity operates without their cognizance of the lower effects, which are therefore to be seen as metaphysical by-products. In that sense, while (self-)intellection necessarily results in causation, it is not accompanied by the cause's necessary knowledge of the effects that issue from it.

[214] See *Metaphysics*, 12.7.1072a22–24.

[215] Al-Fārābī (1964, 52, 1985a, 118–119, and 1985b, 68).

4. *Unity and Multiplicity*

In the previous sections, I identified and analyzed the various corporeal and incorporeal entities that make up al-Fārābī's cosmos. The First Cause, the separate intellects, and the celestial souls and bodies constitute the various classes of existents that constitute his superlunary ontology. This ontological continuum starts with the absolutely immaterial and simple essence of the First and becomes increasingly affected by multiplicity and deficiency as one proceeds downward, until one reaches the celestial bodies and, below them, the realm of generating and corrupting bodies, the four basic elements, and, finally, prime matter. What is more, the immaterial beings themselves are arranged in a hierarchical order depending on their relation vis-à-vis the First. The first separate intellect that inaugurates the series of *thawānī* is purer and nobler than the other intellects due to its proximity to the First. It is the only being directly caused by the First and in that sense it occupies a special status in al-Fārābī's cosmology, although it does not possess for that matter any special function or activity that would be lacking in the other intellects. In turn, the celestial orbs are arranged hierarchically in a descending order depending on the nature of their cause and their degree of perfection, starting with the outermost orb and ending with the orb of the moon.

Approached from another angle, this ontological hierarchy can be reduced to three fundamental principles: intellect, soul, and matter or substrate. All existents according to al-Fārābī consist of one or a combination of these principles. The immaterial realm is exclusively intellectual, and at this level existence can only be of an intellective or contemplative kind. The lower level of soul appears first with the celestial souls, although al-Fārābī's position in this regard is somewhat idiosyncratic in that he defines these souls exclusively as intellects devoid of the other psychological faculties. Like the *thawānī*, these celestial souls are also characterized by thought, albeit of a less unitary kind than the one existing in the immaterial realm. Finally, below intellect and soul lies matter, which participates in the substance of the sublunary beings. Al-Fārābī neatly summarizes this three-fold cosmological structure when he states in *Fuṣūl* that "there are three worlds: spiritual, celestial, and material," by which he means the world of intellect, of soul, and of body or matter.[216]

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[216] Al-Fārābī (2001a, 45).

The subsumption of all immaterial and material existents on three basic levels, corresponding to the three principles of intellect, soul, and body or matter, vividly brings to mind the metaphysics of the late antique Neoplatonists. The Neoplatonists, like al-Fārābī, also organized these principles in a hierarchical scheme, with intellect producing soul, and soul in turn producing nature and inaugurating the corporeal realm. There can be little doubt that al-Fārābī was influenced by this tradition when he composed his mature philosophical works, such as *Fuṣūl*, *Ārāʾ*, and *Siyāsah*, which define intellect, soul, and matter as distinct principles (*mabādiʾ*) organized in a hierarchical pattern.[217] The previous sections showed the ubiquitous influence of the *Neoplatonica arabica* on al-Fārābī's theories of celestial psychology, and so it is only natural to presume that he would have derived this tripartite division of the cosmos from this corpus as well.

It is likely that al-Fārābī used this framework to construe Aristotle's cosmology in Book Lambda, especially with respect to the celestial souls, which are not explicitly formulated in this Aristotelian work. Accordingly, the Neoplatonic theory of Intellect can be made to correspond to the unmoved movers, that of Soul to the celestial souls, and Nature to the realm of corporeality beginning with the orbs, but applying primarily to the sublunary world. A hint that al-Fārābī construed Aristotle's cosmology in such a manner appears in *Falsafat Arisṭūṭālīs*, when he explains that the Stagirite had to inquire into the celestial substance and decide whether it is a "nature, a soul, or an intellect."[218] The phrasing of this statement not only betrays the tripartite division derived from Neoplatonism mentioned above, but in addition suggests that al-Fārābī thought that Aristotle himself organized these very principles in this hierarchical fashion in his cosmology. The attribution of many texts from the *Neoplatonica arabica* to Aristotle in the Arabic tradition can help to explain why al-Fārābī spontaneously interpreted the cosmology of the Stagirite through the tripartite division of intellect, soul, and matter articulated in these works.

Yet in spite of this apparent attempt at harmonization, al-Fārābī's basic metaphysical framework remains primarily indebted to the Stagirite. This appears clearly in the fact that he, unlike most Neoplatonists,

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[217] The latter work in particular opens with a list of principles (*mabādiʾ*), among which figure the intellects (*thawānī*), soul (*nafs*) and matter (*māddah*) (al-Fārābī 1964, 31).

[218] Al-Fārābī (2001c, 129).

does not uphold a theory of a universal or hypostatic intellect and soul that subsequently becomes individuated in particular entities. This observation applies particularly to the concept of soul, which for the Neoplatonists is responsible for generating the world of nature or matter. In contrast to the Neoplatonists, al-Fārābī makes intellect the direct cause of the existence of the celestial bodies (*al-ajsām al-samāwiyyah*), thus bypassing the role traditionally ascribed to soul in Neoplatonic cosmology. The idea to connect matter, whether heavenly or sublunary, directly with intellect is foreign to most Neoplatonic systems. In this case, it can best be explained by al-Fārābī's particular exegetical approach, which consisted in integrating Neoplatonic theories on intellection and demiurgy into a fundamentally Aristotelian cosmological framework, which establishes a direct relation between the unmoved movers and the celestial orbs. Fundamentally, then, al-Fārābī engaged in the daunting task of harmonizing theories derived from two different metaphysical and cosmological systems, which he found in the Aristotelian texts and the *Neoplatonica arabica*. The idea of an inherent compatibility between these systems was surely suggested to him by some of the late antique commentaries and works that he read, but it adopted a particular form in his case, due to the central place occupied by Book Lambda in his cosmology.[219]

Al-Fārābī closely follows the Neoplatonists on another important point, namely, the relation between causation, unity, and multiplicity. A detailed analysis of his terminology of superlunary causation will be given in chapter 3, but at this stage it seems worthwhile to sketch a basic picture of al-Fārābī's causative model and of how it underlies the hierarchical structure of his cosmology.[220] According to the Second Teacher, each entity—whether an intellect, a celestial soul, or an orb—is caused by a higher principle, except for the First, which does not have a prior cause and is completely autonomous. According to this

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[219] I leave the questions open at this point of whether al-Fārābī achieved this synthesis of Aristotelian and Neoplatonic material with a clear perception of the differences between these philosophical traditions and with the cognizance of the true origin of the *Neoplatonica arabica*. This question will be examined in more detail in chapter 3 in connection with creation and causation.

[220] For an enlightening discussion of causation and multiplicity in the works of Plotinus and Proclus, see Rosemann (1996, ch. 2, 63–103) and Steel (2010). Insight into al-Fārābī's views on causation and his relation to the *Proclus arabus* can be gained from the studies of Maróth (1994, 196–215), Janos (2010a), and Vallat ("Al-Farabi's arguments for the Eternity of the World," forthcoming). For a comparison with Ibn Sīnā, see Daiber (2004) and Wisnovsky (2002, 2003a, and 2003b).

theory, the celestial bodies and souls are caused by the separate intellects, while each separate intellect is itself caused either by another and prior separate intellect or by the First Itself in the case of the first separate intellect (i.e., the first of the *thawānī*). These causal relations are not to be conceived of as subsisting in a temporal sphere, since time only appears with the motion of the celestial bodies. Rather, causation in the immaterial realm rests on the essential priority of the cause over the effect, which also implies the greater unity and simplicity of the former over the latter.

Al-Fārābī regards causality as an outcome of the intellective activity in which the souls and intellects are engaged. As we saw earlier, intellection or contemplation (*taʿaqqul*) is the main activity of the First Cause, the *thawānī*, and the celestial souls, and it is as a result of their particular mode of intellection that they cause the existence of other specific entities. More precisely, according to al-Fārābī, causation can issue either from self-intellection or self-reflexivity, that is, from an entity's contemplation of its own essence, or from the intellection of other, exterior, and higher principles. The celestial souls and separate intellects are characterized by this dual introspective and extrospective activity, and it is the multiplicity of their intelligibles that produces a multiplicity of effects. In contrast, in the case of the First, intellection is self-contained and self-reflexive, with a perfect identity of thinker and thought, which means that causation proceeds solely from the First's contemplation of Itself and can result only in a single effect. Finally, and to complete this picture, there can be little doubt that al-Fārābī conceived of this causality as an efficient one, responsible for the existence and sustenance of the various entities of his cosmology (see further ch. 3, 2.6.1–2.). In tying efficient causality to the intellective activity of the immaterial entities, and more specifically to their self-reflexivity, al-Fārābī is following a well-established, yet highly diversified, Neoplatonic trend, which found its main formulations in Plotinus and later in Proclus.[221]

But what is the connection between causation, unity, and multiplicity? Since the degree of unity or multiplicity that is attached to the superlunary entities differs and corresponds to their variegated modes

[221] See Rosemann (1996, 63–103). As this author aptly puts it, "causality manifests the self-reflexivity of being" (90). This holds not only for Plotinus and Proclus, but also for al-Fārābī, who partly makes vertical causality in the immaterial realm a product of the self-contemplation of the intellects.

of contemplation, it is only normal that the nature of their effects would differ as well as a result of this. In other words, the kind of intellection that characterizes a cause also characterizes the number and nature of its effects. Thus, the perfectly unitary intellection of the First leads to a single effect, while the fragmentary intellection of the *thawānī* and celestial souls leads to a progressively greater degree of multiplicity in their respective effects.

This explains why, according to the causal hierarchy that underlies al-Fārābī's entire cosmology, causes are always simpler than their effects, or, put differently, effects are affected by a greater degree of multiplicity than the source from which they proceed. If we invoke the tripartite structure discussed above and apply it to al-Fārābī's cosmology, then this implies that the separate intellects, which are the causes of the celestial souls and bodies, are simpler than these entities, while the celestial souls, which are causes for the phenomena occurring in the sublunary world, are themselves simpler than their sublunary effects. As for the First or God, according to this reasoning, It must be simpler than its single effect, the first separate intellect.[222] As we saw in the previous section, al-Fārābī describes It as being absolutely one (*wāḥid*) and simple (*basīṭ*) and stresses that It is not affected by multiplicity in any way. Its perfectly simple essence thus stands in opposition to matter's absolute potentiality to receive contrary forms. One of the corollaries of this theory is that every effect possesses some degree of multiplicity, regardless of its status in the hierarchy of being.

The notion of multiplicity, which al-Fārābī expresses by means of the Arabic term *kathrah*, is, however, not to be construed in the same way when applied to these various effects. In the case of the intellectual beings, since they are immaterial, they cannot be composed of various parts or elements. Consequently, their multiplicity does not consist in any kind of composition or compositeness (*tarkīb*), but rather in a kind of complexity in their essence. This is due to the special mode of their intellection, which is divided into two objects of thought, the First Cause and their own essence, and it is this duality that constitutes their

[222] This is because the intellection of this first effect is itself dual and thus introduces a small degree of multiplicity in its essence. Al-Fārābī's theory that multiplicity is introduced with the first effect proceeding from the First follows the *Neoplatonica arabica* closely. In *Maḥḍ al-khayr*, for instance, the author states that "originated being [intellect], although it is one, becomes multiple, it receives multiplicity" (Badawī 1977a, 6 and Taylor 1981, 289).

kathrah.[223] In the case of the celestial bodies, in contrast, the notion of multiplicity can refer to composition *and* complexity, as they possess both a corporeal substance and a rational soul engaged in contemplation. First, the celestial bodies are "composed" (*murakkab*) of the two principles of soul (*nafs*) and substrate (*mawḍūʿ*).[224] Second, the celestial souls themselves are complex, due to their three-fold intellection, which apprehends the First, a higher intellect, and their own essence. Finally, the sublunary bodies are affected by multiplicity due to their basic hylomorphic composition, which in turn can be divided further into various elemental combinations constituted by the four elements of fire, air, water, and earth. Multiplicity in this case is associated with matter and thus with the potentiality inherent in material beings to acquire many contrary forms.

Hence, al-Fārābī's concept of multiplicity (*kathrah*) can be construed either in terms of composition (*tarkīb*) in the case of bodies or in terms of complexity (also called *kathrah*) in the case of intellectual entities. In the former case, multiplicity is associated with matter or substrate, while in the latter case it has to do with an imperfect and not wholly unitary kind of intellection. Although al-Fārābī uses the same term *kathrah* to express both concepts, it is clear that a distinction should be made between the two. Since he associates both kinds of multiplicity with division (*inqisām*) and deficiency (*naqṣ*),[225] this theory defines the First Cause as the only entity that is not in any way composed, complex, divisible, and deficient. In other words, the First does not suffer from any kind of multiplicity, either with respect to Its essence or Its intellection. But as one proceeds downward, one encounters an increasing degree of multiplicity and heterogeneity, until one reaches the sublunary world characterized by the absolute receptivity and potentiality of matter. In this manner a correlation is established between the degree of simplicity of a cause and the nature of its effect: a complex cause will necessarily emit an even more complex effect.[226]

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[223] Al-Fārābī (1964, 40–41).

[224] Al-Fārābī (1964, 53).

[225] Al-Fārābī (1964, 40, 53).

[226] Apart from the many remarks dealing with unity and multiplicity that appear in his emanationist treatises, al-Fārābī's interest in this metaphysical topic can also be inferred from his authorship of a treatise entitled *K. al-wāḥid wa-l-waḥdah*. This highly theoretical work discusses in detail the various ways in which something may be said to be one and simple, as well as the various ways in which multiplicity emerges from unity. According to Mahdi (al-Fārābī 1989, preface) and Walzer (al-Fārābī 1985a, 339),

In parallel to the relation between causality and multiplicity and the idea that all existents apart from the First are affected by multiplicity and deficiency, al-Fārābī also holds that all existents are characterized by a certain unity or oneness (*waḥdah*), which is a necessary property of their existence. For al-Fārābī, existence and unity are applicable to all things, from the sublunary, material existents to the separate intellects and the First Cause. As al-Fārābī writes, "one of the meanings of unity [*al-waḥdah*] is the proper existence [*al-wujūd al-khāṣṣ*] by which every existent is distinguished from another, and it is by virtue of this that every existent is called 'one.'"[227] According to this statement, unity is essentially attached to existence, with the implication that every existent also possesses a certain 'unity of existence.'

But this concept manifests itself in various degrees in al-Fārābī's cosmology. The higher one ascends the ontological ladder, the more perfectly and authentically the concept of unity will be embodied, until one reaches the First Cause, in which pure existence and perfect unity are identical.[228] As al-Fārābī explains in his work *K. al-wāḥid wa-l-waḥdah* (*On the one and oneness*), unity can be predicated of the existents in various ways: according to species (*nawʿ*) or genus (*jins*), to number (*bi-l-ʿadad*), to what is composite (*muʾtalif*) and subject to division (*inqisām*), to essence (*bi-māhiyyatihī*), etc. For instance, he explains that composite beings still possess a certain unity, in spite of their composition (*taʾlīf*), which is expressed by the totality formed by their various parts, and he gives the example of the ship (*safīnah*) to illustrate this.[229] This remark applies to all composite and hylomorphic beings, but what about the immaterial beings, which do not suffer from composition? In their case, as al-Fārābī explains, unity refers to their very essence (*māhiyyah*).[230] But this concept is not restricted to the

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this work is chiefly an elaboration on some passages of Aristotle's *Metaphysics*, Book Delta, while for Vallat (2004, 15, note 1) it may be regarded as a commentary on Book Nu. It is clear in any case that al-Fārābī is approaching these issues through the mediation of the Neoplatonic metaphysical tradition, which also delved into the problem of unity and multiplicity at length. As the views expressed in this short treatise are highly abstract, it is difficult to connect them with the cosmological exposition that appears in al-Fārābī's emanationist treatises, especially since this work has not been the object of detailed study.

[227] Al-Fārābī (1964, 44–45) and McGinnis and Reisman (2007, 89).

[228] *Maḥḍ al-khayr*, and Propositions 4 and 20 in particular, upholds a similar view on the First and most likely represents al-Fārābī's direct source of inspiration.

[229] Al-Fārābī (1989, 48).

[230] Al-Fārābī (1989, 51–52).

immaterial beings and can be applied to all entities, "whether divisible or indivisible, whether conceived of by the soul or lying outside the soul," and it is moreover closely connected with the concept of existence (*wujūd*).[231] Hence, not only are there different degrees of oneness, but this concept also applies to things in various ways.

In spite of this, it is presumably this last type of essential oneness that al-Fārābī has in mind when he asserts that the concept of unity, like that of existence, has its starting point in the divine essence.[232] God is not only the First, *al-awwal*, that is, the existent that is essentially prior to all the other existents, but He is in addition one and unique, *wāḥid*, meaning that no other being possesses His perfectly simple and unitary essence and existence. In Him, unity and existence can be found to their utmost degree. This point is conveyed clearly and elegantly when al-Fārābī writes: "Its [i.e., the First's] distinction from everything else is through a unity that is its being [or essence, *bi-waḥdatin hiya dhātuhū*]."[233] It should be noted that this concept of unity can be applied both to the divine existence and intellection, which is one and the same thing in God, although they represent alternative ways of describing His essence.

This conjunction of existence and unity also helps to explain the bond between all things, since each entity derives these qualities from its cause, and this cause from a previous cause, a series which ultimately originates with the First. This means that effects are similar to their causes in that, like them, they possess existence and unity, albeit to a different degree and in a different mode, which is appropriate to their status in the cosmic hierarchy. This idea of a genuine similarity between cause and effect can be further applied to al-Fārābī's metaphysics with respect to the concept of intellect. In causing the first separate intellect, the First also in a sense reproduces a likeness of itself, since both the cause and the effect are immaterial, intellectual, and possess a high, but not identical, degree of unity. Like the First, the *thawānī* are engaged in self-intellection, and in that sense their activity imitates that of the First. Finally, the *thawānī* cause the celestial souls and bodies through their self-reflexivity, thus echoing the causative act of the First. This in turn explains why the celestial souls are, according to al-Fārābī,

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[231] Al-Fārābī (1989, 51).

[232] As for instance in *Iḥṣāʾ* and *Ārāʾ* (al-Fārābī 1949, 100 and 1985a, 68 respectively).

[233] Al-Fārābī (1964, 44) and McGinnis and Reisman (2007, 89).

primarily defined by their intellectual nature, since they share to some degree in the essence of their cause. The intellectual principle is thus conveyed from the level of the First to the separate intellects, then further to the level of the celestial souls and finally to the human rational souls, although it decreases in purity with every level. In each case, the effect resembles its cause and participates to some extent in a similar nature, thus ensuring both the primacy of intellect in al-Fārābī's cosmology and the essential similarity between each class of cosmic existents.[234]

So far, the discussion has focused on the connection between intellection and causation and what this implies in terms of the multiplicity of being; this is the procession or downward motion away from the First, expressed through the concept of efficient causality and the corollary notion of deficiency (*naqṣ*). However, of equal importance is the reversion or upward motion back toward the First, which is also expressed through the concept of intellection, and which is connected this time with final causality. While intellection is the act that necessarily leads to the production of similar, albeit inferior, effects by a given entity, it is also what enables the cosmic existents to actualize their essence and to seek the attainment of their perfection by reverting toward the prior principles. This search for perfection can be explained by a desire for greater unity, a striving to increase one's essential closeness to one's cause, although here as well it manifests itself differently

[234] This idea is vital to the Neoplatonists, for whom "what is produced must always be of the same kind as its producer" (*Enneads* 3.8 [30] 5, 24, quoted and discussed in Rosemann 1996, 89–90); see also Steel (2010). It is also to be found in *Maḥḍ al-khayr* (Badawī 1977a, Proposition 11, 14), which states: "The primary [principles, *al-awāʾil*] are all in one another in the mode appropriate for one to be in the other." The notion of a fundamental similarity between all things surely underlies al-Fārābī's belief in the harmonious order or arrangement of the existents, conveyed through the Arabic terms *tartīb* and *martabah*. The existents, while similar in some respects, are nevertheless arranged hierarchically according to their degree of perfection and the extent to which they embody the concepts of existence and unity. It should be noted that this concept of similarity is mostly to be associated with the intellectual principles in al-Fārābī's metaphysics and cannot as easily be applied to the causation of the celestial bodies, which are also and problematically described as effects of the separate intellects. This point represents one of the idiosyncracies and perhaps shortcomings of al-Fārābī's theory of causation: how can the bodily orbs be said to be caused by immaterial intellects, without even the mediation of soul? The Greek Neoplatonists had made soul the mediator between intellect and corporeality, but the *falāsifah* make both the souls and bodies of the orbs directly dependent on the separate intellects. Although this

depending on the class of beings examined. In the case of the orbs and planets, their souls inhere in a substrate that prevents them from acquiring the perfections of the immaterial existents and that can only be actualized through motion. Consequently, they possess according to al-Fārābī the highest corporeal perfections, including circular motion, which in a sense reproduces at a corporeal level the circularity associated with self-reflexivity. In the case of the *thawānī*, their contemplation of the First and their striving to imitate Its perfect existence and absolute unity is sufficient to actualize their substance to its utmost degree, although they too fall short of acquiring the absolute unity and perfection of the First.[235]

At this point, one clearly perceives the complementarity and partial overlap between efficient and final causality in al-Fārābī's cosmology. Both are grounded in the concept of intellection, and, more specifically, in the contemplative act that accompanies the reversion toward the prior principles. According to al-Fārābī, the causation of other beings by the intellects, i.e., their activity as efficient causes, necessarily occurs as a result of their turning backward toward their cause and inward toward their own essence, and in no sense can it be associated with a motion or intention directed downward toward the lower existents. As we have seen previously, al-Fārābī denies that the separate intellects and celestial souls know what lies beneath them, which means that efficient causation is not defined in terms of the providence or care that the celestial beings have for their effects. Rather, the contemplation of these entities is turned either toward itself, in an act of self-reflexivity, or toward the higher principles, on which they depend and which they strive to imitate. Hence, it is the very act of return or reversion of the souls and intellects toward their source that leads to their producing lower effects.

In that sense, efficient causation may be regarded as the corollary of the intellective act of reversion of the souls and intellects, as well as

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represents a major problem with respect to their theories of causality, al-Fārābī, and more surpisingly Ibn Sīnā, do not address this issue in any satisfactory way.

[235] The relation between the concepts of perfection and final causality has been thoroughly discussed by Wisnovsky (2002 and 2003, 108–112). In spite of their differences, Proclus and al-Fārābī agree on the key idea that the perfection of the celestial souls and intellects and their causative activity derive from their intellective act of reversion toward the prior principles.

a by-product of it. For this reason, it is tempting to conclude that final causality enjoys primacy in al-Fārābī's cosmology, to the extent that the proposition was recently made to eliminate efficient causality entirely from his system.[236] At any rate, it seems more accurate to conclude that in al-Fārābī's view, both types of causality are closely connected to one another as well as to the concepts of unity and multiplicity. The results of the foregoing discussion may be represented schematically as follows:

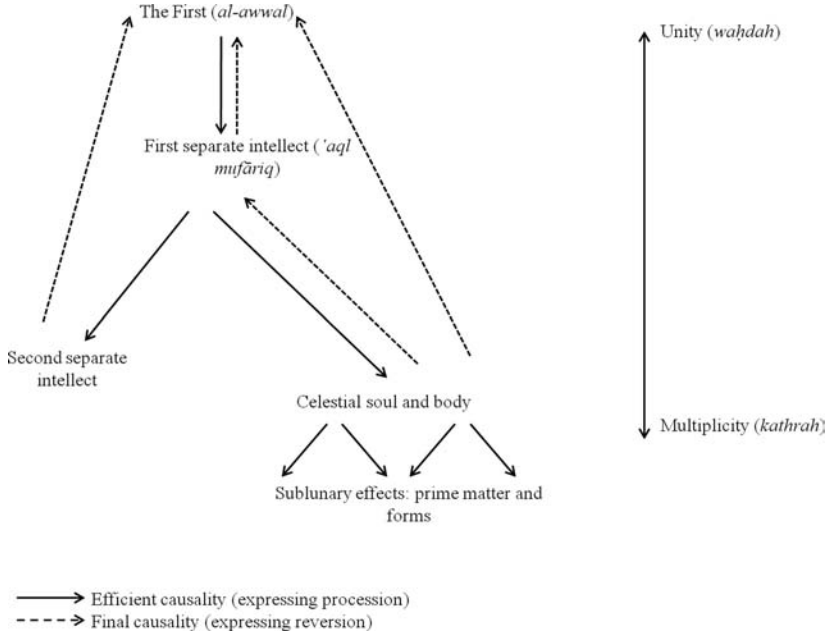

Figure 4. Al-Fārābī's cosmological hierarchy

[236] See the thought-provoking article by Vallat ("Al-Farabi's arguments for the Eternity of the World," forthcoming). As Vallat (18) writes: "Farabi regards the final cause as sufficient reason for the existence of its effects, which plainly reduces efficient causality to the final one." Although this idea is interesting, the evidence in al-Fārābī's corpus does not in my view lend itself to such a conclusion. Al-Fārābī clearly states that the First and the separate intellects are causes *of existence* (*wujūd*), implying that they must be efficient causes (see al-Fārābī 1964, 31, 40–41, 52). Moreover, in his *Fuṣūl mabādiʾ*, al-Fārābī (1968, 79) states that the First is the efficient (*awwal fāʿil*), final (*ghāyah*), and formal (*ṣūrah*) cause of all the existents (*li-sāʾir al-mawjūdāt*). Finally, Vallat's argument weakens the strong connection between intellection and demiurgy articulated by Proclus and fully endorsed by al-Fārābī. Efficient and final

In conclusion, one observes that al-Fārābī's cosmology embodies to a high degree several fundamental Neoplatonic postulates. First, causation and the production of lower existents are to be regarded as a logical outcome of the (self-) intellection of the cosmic entities; intellection is thus intrinsically demiurgic (ch. 3, 2.6.2.). Second, the intellection of the intellects and souls results in a causality that is characterized by a dual orientation: a downward one (efficient causality), and an upward one (final causality), which is used to explain both the existence of the celestial entities and the perfectibility of their existence respectively. Third, causes are always simpler than their effects, a theory that gradually leads from unity to multiplicity. Fourth, there is a similarity between causes and their effects, thus accounting for the diffusion of existence, unity, and the intellectual principle throughout the cosmos and reinforcing the ontological continuum that has its point of origin in the First.

5. *Conclusion*

The structure of al-Fārābī's cosmology is original and unprecedented in the early Arabic philosophical tradition. It emerged out of a complex process of exegesis, assimilation, and transformation of the Greek sources. The previous analysis elaborated on past scholarly contributions by examining some of the key works underlying al-Fārābī's theories and by reconstructing his interpretation of specific cosmological questions addressed in these texts. In addition to confirming the importance of Aristotle's *Metaphysics* and Alexander's *Mabādiʾ*, already stressed by Maróth and others, the study highlighted al-Fārābī's debt to the *Proclus arabus* and also introduced new sources into the discussion, such as *Quaestiones* attributed to Alexander, Ptolemy's *Planetary Hypotheses*, and Simplicius' commentary on *On the Heavens*. The analysis showed that al-Fārābī did not merely reproduce or slavishly copy the contents of these works, but critically selected and adapted their

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causality represent two sides of the same coin, depending on whether the procession away from, or the reversion toward, the First is emphasized. This was the view adopted by many Neoplatonist commentators on Aristotle, and it seems to be al-Fārābī's position as well. For a general treatment of efficient and final causality and their interrelation in ancient philosophy, see Rosemann (1996, ch. 1 and 2, 33–103); and for a discussion of this subject in the works of Ibn Sīnā, see Wisnovsky (2002 and 2003, 183–195).

theories to develop an original cosmological model. In doing so, he achieved a remarkable synthesis of various philosophical and astronomical theories, whose meaning and function in his cosmology are largely defined by the new structural relations that connect them.

Perhaps the most outstanding structural feature of al-Fārābī's cosmology is the introduction of a level of separate intellects between the First and the corporeal world, which marks an important metaphysical shift in early Arabic philosophy and redefines the relation between the divine world and matter. Equally striking is the manner in which he describes the nature and function of these intellects. By focusing on the questions of the nature, number, and activity of the unmoved movers, the analysis showed that al-Fārābī's cosmological project consisted to a large extent in an original interpretation of Book Lambda in light of the *Proclus arabus*. It was argued that al-Fārābī significantly elaborated on this Aristotelian tenet by relying on some of the late antique commentaries and the *Neoplatonica arabica*, which enabled him to integrate Neoplatonic ideas on causation and intellection into a cosmological framework that combines Aristotelian physical and metaphysical theories with Ptolemy's planetary models.

In his treatment of the activity of the celestial souls and intellects, and in his theorizing of the key concepts underlying his metaphysical and cosmological thought—unity and multiplicity, intellection and causation, efficient and final causality—al-Fārābī is inscribed in an ongoing intellectual tradition that has its roots in the late antique philosophical worldview. His cosmology may rightly be regarded as an extension of the philosophical project begun centuries earlier with the 'Ammonian synthesis,' which has been thoroughly described by R. Wisnovsky with respect to Ibn Sīnā's cosmology. The next chapter will largely confirm this view and will try in addition to open other perspectives for interpreting al-Fārābī's development as a philosopher.

CHAPTER THREE

MATTER AND CREATION: A SHIFT IN PARADIGMS?

The two previous chapters have shed light on al-Fārābī's method, on the structure of his cosmology, and on his interpretive approach to the ancient philosophical and astronomical texts. This chapter intends to examine the last point in more depth, by providing a case study of al-Fārābī's views on the nature and origin of celestial matter. Celestial matter was a central concept in ancient and medieval cosmology, especially due to its significance in the debate concerning the creation or eternity of the world. Given al-Fārābī's place in the history of Arabic cosmology, his views on the subject deserve to be accurately examined. How did al-Fārābī construe Aristotle's theory of aether? What place does celestial matter occupy in his cosmology? What is the relation between al-Fārābī's theories of matter and his views on creation? Did his theories change over the course of his life, and, if so, for what reasons? These questions will inform the following discussion and provide a background for the subsequent analysis of al-Fārābī's views on creation and causation.

1. *The Nature of Celestial Matter*

The purpose of this first section is to investigate al-Fārābī's views on the nature and composition of celestial matter, a key issue discussed at length by the ancient commentators. These discussions appear chiefly in works on natural philosophy, such as commentaries on Aristotle's *On the Heavens*, but also occasionally in a metaphysical and astronomical context. The following analysis will attempt to reconstruct al-Fārābī's views on the subject by relying on the scattered evidence that can be collected from his corpus, as well as on the reports of later thinkers.

1.1. *Al-Fārābī's Hylic Terminology*

In various parts of his works al-Fārābī emphasizes the difficulty of elaborating a philosophical terminology that would be devoid of ambiguity and obscurity. Being aware of the long history of philosophy

before Islam, and endorsing an empirical model for its development, he acknowledged the risks inherent in the project of transferring and translating philosophical terms and notions from one culture to another. Al-Fārābī's general outlook in this regard also applies to the hylic terminology he inherited from the Greek to Arabic translation movement. Indeed, he seems to have been particularly troubled by the proper translations and transliterations of the Greek terms referring to matter. In contrast, his predecessor al-Kindī was much less critical on this point. While he frequently relies on the transliterated term *hayūlā* to render the Greek ὕλη, al-Kindī's *Risālah fī ḥudūd al-ashyā'* includes entries for other hylic terms such as *ʿunṣur* and *ṭīnah*, whose exact meaning is difficult to establish despite the definitions provided.[1]

In contrast to al-Kindī, al-Fārābī shows a keen awareness of the semantic nuances of Arabic terms expressing matter. In *Ḥurūf*, he explains that *ʿunṣur* may mean both 'element' and 'matter' and should therefore be avoided because of its ambiguity.[2] Al-Fārābī's omission of *ʿunṣur* in his works is notable and can be explained—in addition to the perceived ambiguity of this term—by the fact that it became associated with the concept of intelligible matter in the Pseudo-Empedoclean tradition and in the early Arabic doxographies.[3]

Al-Fārābī's personal preference goes to the two terms *hayūlā* and *māddah* (pl. *mawādd*), although the latter term is by far the most common in his works.[4] It is notable that the same word (*māddah*) is used by

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[1] Al-Kindī (1950–53, 219–220 and 257). Both of these Arabic terms possess basic, non-technical meanings, but they were also appropriated by early Arabic intellectual movements influenced by Greek thought. The root *ṭ-y-n*, which is of Qur'ānic origin, usually connotes concrete, physical matter. The term *ṭīn* appears several times in the Qur'ān (e.g., 17:61, 38:76, etc.), where it is usually translated as clay; see Wolfson (1947–48). In contrast, *ʿunṣur*, whose primary meaning is 'race' or 'origin,' assumed a wide variety of senses in a philosophical context and can refer to the concrete elements or to a spiritual kind of matter; see the articles by Netton and Gardet in *EI²*.

[2] Al-Fārābī (1970, sec. 156, 159).

[3] For an interesting discussion of *ʿunṣur* and of its place in the Pseudo-Empedoclean tradition, see De Smet (1998); see also Rudolph (1989, 37) and Jolivet (1995). Al-Kindī (1950–53, 166) uses this term in a somewhat idiosyncratic fashion to refer to "the matter of everything," a definition possibly influenced by Pseudo-Empedoclean ideas. Cf. Wolfson (1947–48).

[4] The plural form *mawādd* occurs in many places in the Fārābīan corpus: al-Fārābī (1964, 41, 1938, 19, 1970, 99–100, 1991, 34, and 1992, 63). Ibn Sīnā also uses this plural, as in *Najāh* (1985, 312,13). It is difficult to perceive any difference in meaning between *māddah* and *hayūlā*. Unlike *hayūlā*, which is a transliteration of the Greek ὑλη, *māddah* is an Arabic term whose original meaning is 'stuff' or 'substance.' One is tempted to distinguish between a notion of physical, corporeal matter (*māddah*) and one of material potency (i.e., matter as potency, *hayūlā*), but this distinction does not seem to be

al-Fārābī in some of his treatises to describe both sublunary matter and the special celestial matter.[5] This terminological overlap leads to the important observation that al-Fārābī does not have a special word to refer to celestial matter exclusively. Indeed, the Second Teacher shuns the terms 'aether' (*athīr*), 'first substance' (*al-jawhar al-awwal*), and 'fifth nature' (*al-ṭabīʿah al-khāmisah*) that appear in early Arabic philosophical works. These terms had become associated with Aristotle's doctrine of aether and with the Peripatetic tradition on *On the Heavens*.[6]

The complete omission of the traditional Peripatetic hylic terminology in al-Fārābī's corpus need not indicate that he rejected the theory of aether. However, it definitely raises the possibility that he substantially transformed Aristotle's doctrine, especially when it is combined with independent doctrinal evidence drawn from his treatises.[7] If one approaches al-Fārābī's cosmology with the assumption that it is merely a replica of Aristotle's, then this terminological omission proves difficult to explain. Conversely, if one hypothesizes that al-Fārābī creatively transformed the theories that reached him, then the omission of this terminology may point to a redefinition of celestial matter in al-Fārābī's

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vindicated by the textual evidence in any consistent fashion. One of the reasons for this is that in the sublunary world, there is an almost perfect equation between matter and potency.

[5] For example, in *Iḥṣāʾ* and *Radd*, *māddah* designates Aristotle's aether; see al-Fārābī (1949, 96) and Mahdi (1967, passim).

[6] This is true not only of al-Fārābī's philosophical treatises, but also, and more surprisingly, of his account of Aristotle's philosophy in *Falsafat Aristūṭālīs* and of his defense of aether in *Radd*.

[7] The question of how to interpret Aristotle's aether is controversial and puzzled most of the late antique commentators, just as it puzzles modern historians. Exactly what kind of matter aether is, the role it plays in celestial motion, the extent to which it is reconcilable with the theory of unmoved movers in Book Lambda, and whether there are several grades of aether are questions that are still unclear; for more information, see Jaeger (1948), Moraux (1963 and "Introduction" in Aristotle 1965), Strohmaier (1996), and Guthrie (2000, xv ff.). Throughout intellectual history, evidence gleaned from various Aristotelian texts was assembled to defend very different interpretations. Aristotle calls aether the "first body" and often discusses it as if it were another element, albeit with different properties, as in *On the Heavens* 1.2-4. Moreover, the celestial bodies are visible, and Aristotle equates visibility and materiality. These points suggest that Aristotle conceived of aether as something material and corporeal. But in *Metaphysics* 12.2.1069b25, he suggests that the heavens may have matter that should be understood exclusively as potency for motion in place, while at 8.4.1044b5-8 he suggests that some natural and eternal beings, i.e., the celestial bodies, may have no matter, or, again, only matter for motion in place. This ambiguity in the Aristotelian doctrine was used as a starting point for subsequent Peripatetic and Neoplatonic elaborations on the question of celestial matter.

cosmology. Keeping this in mind, I wish to turn to the evidence concerning al-Fārābī's views on celestial substance in his corpus.

1.2. *A Survey of Celestial Matter in al-Fārābī's Philosophy*

1.2.1. *The Fārābīan Corpus*

Iḥṣāʾ

Al-Fārābī states in *Iḥṣāʾ* that the second part of the physical science studies simple substances, whether they exist, how many they are, and other such questions. According to al-Fārābī, the term "simple bodies" (*ajsām basīṭah*) encompasses not only the four sublunary elements fire, air, water, and earth, but also the matter of the heavens, which in the Peripatetic tradition is considered a fifth element. As al-Fārābī explains, physics studies "the heavens and its various parts as being made of a certain one matter [*māddah mā fīhā wāḥidah*]."[8] The inclusion of the celestial substance in the physical inquiry is in line with the *On the Heavens* tradition of late antiquity, which al-Fārābī here follows. In fact, he refers explicitly in this same passage to Book 1 of Aristotle's work. The use of the term *māddah* to signify celestial matter in this passage of *Iḥṣāʾ* is notable, because it is one of the very rare instances in the Fārābīan corpus where it is applied to the superlunary world and where al-Fārābī refers unambiguously to the heavens as being material. In this particular case, it can be explained by the fact that he is using Aristotle's *On the Heavens* as a model for his discussion of celestial physics.

Falsafat Arisṭūṭālīs

This work, which purports to provide an overview of Aristotle's philosophy, contains information about al-Fārābī's understanding of Aristotle's aether theory. Al-Fārābī writes that

> he [Aristotle] explained that there are five primary simple bodies [*al-ajsām al-basīṭah al-uwal*] that constitute the world. … One of them is the outermost body that moves in a circular motion: the remaining four have common matter but are different in their forms: the fifth [aether] differs from these four in both its matter [*māddatihī*] and its form [*ṣūratihī*], and is the cause [*sabab*] of the existence of these four.[9]

Although this might seem like a faithful exposition of Aristotle's theory of the elements, there are a few notable points that particularize

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[8] Al-Fārābī (1949, 34). This passage and the one preceding it are in brackets in this Arabic edition and do not appear in all manuscripts.

[9] Al-Fārābī (1961a, 99,5–11 and 1969, 104, translation slightly revised).

al-Fārābī's summary and signal a departure from Aristotle. First, al-Fārābī attributes to Aristotle the view that the heavenly bodies are composite. According to this account, aether possesses a different "form" and a different "matter" from the ones constituting the sublunary elements. This is slightly surprising, since Aristotle does not specify anywhere in his works that aether is a compound of form and matter, and he describes the fifth element as a simple and homogeneous body. Al-Fārābī's wording here can perhaps be explained in terms of the influence of the ancient commentators, who often debated about whether or not the heavenly bodies are simple substances. In any case, aether is defined in this passage as a hylomorphic substance. Second, the idea that aether is the "cause" (*sabab*) of the other sublunary elements also appears as an addition to the original Aristotelian doctrine.[10] True, Aristotle in *On Generation* 2.10 explains that the sun plays an important role in causing the generation and corruption of sublunary bodies, but he does not explicitly make the heavens the cause for the existence of the sublunary elements and sublunary matter. Hence, this passage does not merely summarize Aristotle's ideas but also betrays a subtle transformation of the Aristotelian doctrine.

Radd

This treatise offers interesting, but ambiguous information about al-Fārābī's interpretation of the aether theory. The context is a defense of Aristotle's cosmology against Philoponus' attack. Philoponus had criticized Aristotle's aether theory in order to undermine his doctrine of the eternity of the world. Al-Fārābī retorts in this treatise that Aristotle's intention was not to prove the eternity of the world, but merely to explain the difference between aether and the other four elements. At one point in the treatise al-Fārābī writes:

> Thus, by some of those statements, Aristotle explained that the form [*ṣūrah*] of that part of the world which is the body that moves with a circular movement is not the same as the form of any other part of the world. By others it becomes evident that not even its matter [*māddah*] is the same as the matter of [any other part of the world]. And by [still] others it becomes evident that its matter is not the same as the matter of anything at all of the bodies in general, whether parts of the world or a body whose position is outside of these.[11]

[10] Davidson (1992, 48, 63–64) has already noted this particularity of al-Fārābī's interpretation of aether.

[11] Al-Fārābī (1972, 273), Mahdi (1967, 254, translation slightly revised).

In this passage al-Fārābī explicitly refers to some well-known Aristotelian theses: that the heavens are made of a unique element that is different from the sublunary elements, and that the heavens move in a circular motion. What is more surprising here is al-Fārābī's mention, as in *Falsafat Arisṭūṭālīs*, of both the form (*ṣūrah*) and matter (*māddah*) of the heavens, which implies their hylomorphic composition, and which would seem to go against the notion of the perfect simplicity of aether. But in spite of this minor doctrinal modification, one may safely conclude that al-Fārābī is not only defending Aristotle's cosmology against the attacks of the Christian philosopher-theologian, but that he himself adhered to the aether theory or a variant of it. Hence, *Iḥṣāʾ*, *Falsafat Arisṭūṭālīs*, and *Radd* ascribe matter (*māddah*) to the heavens and endorse Aristotle's theory of aether as it is discussed in *On the Heavens*, sometimes mentioning this work by its title. In these three texts, al-Fārābī exposes and, one assumes, endorses this vital feature of Aristotelian cosmology.

Ārāʾ and *Siyāsah*

A very different theory of celestial matter is articulated in some of al-Fārābī's other treatises, especially *Ārāʾ* and *Siyāsah*. In *Ārāʾ*, al-Fārābī writes that the celestial bodies possess a soul (*nafs*) that can be compared to form (*ṣūrah*), as well as a substrate (*mawḍūʿ*) in which this soul-form inheres. Although these celestial substrates can be compared to the material substrates of sublunary beings, they are not truly material, but rather resemble matter. As al-Fārābī puts it, the celestial bodies "have substrates that resemble [*tushbihu*] the matters laid down to bear the forms [*al-mawādd al-mawḍūʿah li-ḥaml al-ṣuwar*]."[12] Unlike the sublunary material substrates, however, which can receive many contrary forms, the celestial substrates can receive only one unique form and, hence, do not suffer from the contrariety associated with matter, i.e., change and corruption. This unique soul-form is different in each celestial body and is essentially an intellect (*ʿaql*), in spite of the fact that it inheres in a substrate.[13]

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[12] Al-Fārābī (1985a, 120, translation slightly revised, and 1985b, 69). The use of analogy in this passage suggests that Walzer's translation of the previous sentence *wa-hādhihī tujānis al-mawjūdāt al-hayūlāniyyah* as "these [celestial bodies] belong to the same genus as the material existents" is an inadequate literal rendition of the Arabic text. As *Siyāsah* (al-Fārābī 1964, 31) clearly states, the heavenly bodies belong to another genus from that of the sublunary existents. A more accurate translation of *tujānis* would be "resemble" or "are like."

[13] Al-Fārābī (1985a, 120–123 and 1985b, 70–71): the substrates do not "prevent their forms from thinking and from being intellect in their essences."

One finds a similar but more pronounced trend in *Siyāsah*. Having explained at the beginning of this treatise that form and matter are among the six principles of existents and that they are in bodies but are not themselves bodies,[14] one would expect al-Fārābī to apply these principles to the orbs and planets, since these are after all bodies (*ajsām*). But as in *Ārāʾ*, al-Fārābī employs analogical language or a language of similarity to argue that the heavenly bodies with their soul and substrate merely "resemble the substances composed of matter and form" (*tushbihu l-jawāhir al-murakkabah min māddah wa-min ṣūrah*).[15] However, al-Fārābī plainly asserts that "their [heavenly] substrates are not material (or are not matters)" (*ghayra anna mawḍūʿātahā laysat mawādd*) and that they are free from any aspect of deficiency that is in sublunary matter.[16] In addition, he also repeats the argument of *Ārāʾ* that the heavenly substrates can only receive one form and that this form is a soul.

The terms "matter" (*māddah*) and "substrate" (*mawḍūʾ*) are frequently encountered in al-Fārābī's physics and were part and parcel of the technical philosophical vocabulary of his day. Al-Fārābī follows the Peripatetic tradition according to which sublunary beings are a compound of matter and form. Matter is defined as a substrate that receives form, each principle being unable to subsist without the other. In *Ārāʾ* al-Fārābī explains these principles by citing the stock example of the wooden bed: matter is the wood of the bed, form its shape. He then writes: "Matter, then, serves as substratum for the subsistence of form,"[17] meaning that the form of the bed inheres in its matter. Both form and matter make up a compound and as such are distinguishable one from the other only conceptually.

In the case of the heavens, however, the relation between form and substrate is not the same as in sublunary physics. Al-Fārābī does not explicitly ascribe matter to the celestial bodies and consistently uses the term *mawḍūʿ* instead of *māddah*. He resorts to analogical language to compare the celestial and sublunary substrates, noting that the celestial substrates "resemble" the sublunary matters (*mawādd*) in their capacity to receive form. But the analogy between heavenly and sublunary substrates ends here, for besides this capacity to receive form, the two

[14] Al-Fārābī (1964, 31).
[15] Al-Fārābī (1964, 53).
[16] Al-Fārābī (1964, 41).
[17] Al-Fārābī (1985a, 109 and 1985b, 64).

types of substrates have nothing else in common. The sublunary substrates are material precisely by virtue of their capacity to receive different and contrary forms. As al-Fārābī writes, "what has a contrary has a matter common to it and to its contrary."[18] Contrariety and potency affect sublunary substrates, but the celestial substrates are affected by neither. Because the heavenly bodies do not accept contrary forms, they cannot be made of the same potential matter that composes sublunary beings. Moreover, the form of the heavenly body is also essentially different from that of sublunary beings, since in the case of the former it is unique and is a rational soul, whereas in the case of the latter it may be replaced by other contrary forms.

Al-Fārābī's insistence on ascribing substrate, but not matter, to the celestial bodies becomes easier to understand when one realizes that he consistently distinguishes these two concepts in his philosophy. For example, when discussing the essence of God, al-Fārābī explains that "[God's] existence is devoid *of every matter and every substrate* [*bal wujūduhū khalwun min kull māddah wa-min kull mawḍūʿ*]."[19] Al-Fārābī reiterates this distinction in another passage: the heavenly body "is distinct from the First and from the ten 'separate' intellects, which are *free from matter and any substrate* [*yufāriqu l-awwal wa-l-ʿasharah al-mutakhalliṣah min al-hayūlā wa-min kull mawḍūʿ*]."[20] Even in the sublunary world, where substrate and matter are closely related and seem virtually interchangeable, the two concepts are not identical. In *Fī l-ʿaql*, al-Fārābī states that substrates can be "*either* bodies [i.e., matter] *or* powers in bodies [*wa-ẓāhir anna l-mawḍūʿāt … immā ajsām wa-immā quwan fī ajsām*]."[21]

Hence, as these citations clearly show, al-Fārābī distinguishes substrate from matter and considers the former to be conceptually broader than the latter: matter is always a substrate for other things, but not all substrates are material. This means that, although the Second Teacher is willing to ascribe substrate to the celestial bodies, it should not be inferred that this substrate is material in nature. While this idea is only

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[18] Al-Fārābī (1985a, 114–115 and 1985b, 67).

[19] Al-Fārābī (1985a, 58–59 and 1985b, 38, my emphasis).

[20] Al-Fārābī (1985a, 123, translation slightly revised, and 1985b, 70).

[21] Al-Fārābī (1938, 33). A few lines below, al-Fārābī mentions that the celestial bodies provide the Agent Intellect with both the matters (*mawādd*) *and* the substrates (*mawḍūʿāt*) on which it acts (al-Fārābī 1938, 34). By substrates, al-Fārābī probably has in mind the faculties of the human intellect that are actualized by the Agent Intellect and which are not properly speaking material.

implicitly suggested in *Ārāʾ*, it is more clearly articulated in *Siyāsah*, which emphasizes that the heavenly substrates are immaterial.[22] The two treatises conspicuously rely on analogical language to express this particular point. All in all, the style and ideas developed in these two works are strikingly close in spirit and suggest that they were written during the same period.

1.2.2. *Later Reports*

Al-Ghazālī's *Tahāfut al-falāsifah*

It has often been noted that *Tahāfut* is a valuable work not only for the arguments it contains, but also for the information it provides concerning the doctrines of the *falāsifah*. Among other subjects, this work addresses cosmological issues, especially the question of the creation or eternity of the world. It is on this point in particular that al-Ghazālī intends to refute what he considers to be the heretical and misinformed views of the philosophers. One passage is relevant to the subject under discussion. Al-Ghazālī finds fault with the *falāsifah*'s belief that the heavenly orbs are hylomorphic and composed of form (*ṣūrah*) and matter (*hayūlā*), and that these are caused to exist by a single immaterial intellect. According to al-Ghazālī, the *falāsifah* fail to explain adequately how these principles can be caused by the separate intellects, which are by essence simple and thus cannot provide multiple effects.[23] This point is one of many that are used to build an overarching argument against the *falāsifah*'s theory of eternal causality.

Now, al-Ghazālī states at the beginning of the *Tahāfut* that he will limit his refutation to the theories of al-Fārābī and Ibn Sīnā: "the most reliable transmitters and verifiers among the philosophers in Islam are al-Fārābī Abū Naṣr and Ibn Sīnā. Let us then confine ourselves in refuting what these two have selected and deemed true of the doctrines of their leaders in error."[24] Yet, we have seen that unlike Ibn Sīnā, al-Fārābī does not hold a standard hylomorphic view on the celestial substance, and he substitutes immaterial substrate for matter in his emanationist works. Moreover, al-Ghazālī describes a threefold mode of intellection

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[22] This is also Druart's (1999, 218b) conclusion: the celestial bodies, she writes, "have neither form nor matter in the proper sense and, therefore, are not subject to the hylomorphic composition."

[23] Al-Ghazālī (1997, 73–76).

[24] Al-Ghazālī (1997, 4–5).

to explain the causation of the orbs, which was developed by Ibn Sīnā, not al-Fārābī, who endows the separate intellects with twofold intellection only. Hence, one may conclude that al-Ghazālī's depiction of al-Fārābī's theory of celestial substance and intellection is either deliberately or accidentally inaccurate. Consequently, *Tahāfut* seems to be primarily a refutation of Ibn Sīnā's cosmology. There is little if no effort on al-Ghazālī's part to distinguish between the theories of these two *falāsifah* and to provide a nuanced account of their views, and for this reason the *Tahāfut* is of little interest to our inquiry.[25]

Maimonides' *Guide of the Perplexed*

Maimonides' *Guide*, in contrast, provides valuable information in the form of an interesting, if somewhat tantalizing, quotation allegedly borrowed from al-Fārābī's commentary on *Physics*. In the context of a polemical argumentation against the eternalists, Maimonides refers to the authority of the Second Teacher to lend weight to his claim that, since the stars are immobile and the orbs are mobile, they must be made of different matter. He writes:

> For the fact that a sphere is always in motion and a star is always fixed proves that the matter of the stars is not the matter of the spheres. In fact, Abū Naṣr [al-Fārābī] in his glosses on the "Akroasis," [*Physics*] has made a statement of which the literal text is as follows. He said: There is a difference between a sphere and the stars, for a sphere is transparent whereas the stars are not transparent. The cause for this lies in the fact that there is a difference between the two matters [*al-māddatayn*] and the two forms. But this difference is small. This is literally the text of his statement.[26]

There are a few striking features about Maimonides' citation that require clarification. First, although the mention of al-Fārābī undoubtedly strengthens the claim that Maimonides is trying to make, there is a discrepancy between the contexts of their arguments. Maimonides infers the need for various celestial matters from the contrast between mobile spheres and immobile stars. His is, thus, an argument based on motion. Al-Fārābī, on the other hand, comes to the same conclusion on the basis of a distinction between transparent and non-transparent heavenly bodies. Maimonides acknowledges this when he further

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[25] This lack of discernment is, of course, in line with the polemical character of the work; on this issue, see Griffel (2005).

[26] Maimonides (1963, vol. 2, 309). For an analysis of Maimonides' theory of celestial matter, see Glasner (2000, especially 320–323).

writes: "I, however, do not say "small," but say that they [the two matters] are very different. For I do not infer this from the fact of transparency, but from the motions."[27] Obviously, what is of interest and value to Maimonides is al-Fārābī's conclusion concerning the different grades of celestial matter, not the reasoning he develops to reach this conclusion. This disregard for the context from which arguments are borrowed is typical of polemical works.

Of much greater relevance to the present discussion, however, is the cosmological idea that Maimonides ascribes to the Second Teacher, according to which different kinds or grades of matter exist in the heavens. This idea not only fits awkwardly with the previous passage quoted from *Iḥṣāʾ*, which refers to "a certain one matter," but it also plainly contradicts al-Fārābī's other theories of celestial substrate in *Ārāʾ* and *Siyāsah*. Maimonides' quotation evokes various Greek theories of celestial matter, such as the one developed by Philoponus, who argued that the heavens are composed of various elements and do not form a homogenous whole. In the Arabic tradition, Abū l-Barakāt al-Baghdādī apparently held such a view as well.[28] But as far we know, al-Fārābī never adhered to a Philoponian conception of celestial matter. This is clear from his refutation of the Grammarian's cosmological theories in his treatise *Radd*—which focuses expressly on the elements and aether—as well as from the views he articulates in his own works. Alternatively, there is no evidence to conclude that al-Fārābī ever adhered to the atomistic theory defended by the *mutakallimūn*. How, then, are we to interpret this passage?

Since al-Fārābī's commentary on *Physics* has not survived, except for a few fragments in Latin translation, there is no way of verifying Maimonides' report.[29] Although the latter's exaggerated emphasis on the fact that he is quoting al-Fārābī "literally" and the polemical use he makes of this quotation are a bit suspicious, one should not dismiss his testimony as wholly unsound. The more likely hypothesis is that al-Fārābī may actually have upheld such a view in his *Physics* commentary and during a period of his life that coincided with his early philosophical formation. For the fact that Maimonides transmits al-Fārābī's view in the midst of arguments designed to prove the createdness of the world shows that this type of theory of celestial matter fitted well in a

[27] Maimonides (1963, vol. 2, 309).
[28] Sambursky (1962, 154 ff.) and Pines (1979, vol. 1, 179–180).
[29] These fragments were published by Birkenmajer (1935).

creationist context.[30] In this sense, it should be connected with al-Fārābī's possible endorsement of creationism—as evidenced by *Jamʿ* and *Jawābāt*—and with his study of Aristotle with Christian scholars. On the other hand, it is difficult to imagine how the view conveyed by Maimonides could be adjusted to an eternalist framework, since different grades of celestial matter would seem to undermine the notion of elemental simplicity usually associated with an eternal heaven. In any case, Maimonides' testimony indicates that at one point in his life, and more precisely during the time he composed his commentary on *Physics*, al-Fārābī upheld the view that the heavenly bodies consist of different grades or kinds of matter.

Ibn Rushd's *Middle Commentary on On the Heavens*

A diametrically opposed testimony is presented by Ibn Rushd in his *Middle Commentary on On the Heavens*, one of three Averroistic commentaries devoted to this work to have survived. In his discussion of celestial hylomorphism, Ibn Rushd surveys the views of previous thinkers and states that

> Alexander acknowledged that the heavenly body is simple and not composed of form and matter [*basīṭ ghayr murakkab min māddah wa-ṣūrah*], as is clear from his commentary on Book Lambda. Know that there is no disagreement among the commentators [*al-mufassirīn*] on this point, as is shown by Themistius' commentary [*sharḥihī*, i.e., his paraphrase] on *On the Heavens*, when he says that the celestial body has no substrate [*lā mawḍūʿa lahū*]. Likewise [*wa-kadhālika*] Abū Naṣr [al-Fārābī] stressed this point.[31]

Although this quotation is a precious testimony for my overarching argument, it is not without its ambiguities. The most obvious, yet crucial point is that Ibn Rushd in this passage ascribes the theory of immaterial and non-hylomorphic heavenly bodies to al-Fārābī, a report that corroborates the evidence found in *Ārāʾ* and *Siyāsah*. If the celestial bodies are devoid of "substrate," as Ibn Rushd tells us on al-Fārābī's behalf, then they obviously cannot possess any kind of matter, for matter always functions as a substrate for form.[32] Because Ibn Rushd makes a point to cite al-Fārābī together with the Greek thinkers (but he does not, significantly, mention Ibn Sīnā, whose theory of celestial substance

[30] This, at any rate, is how Maimonides seems to understand al-Fārābī's argument; see the general context in Maimonides (1963, vol. 2, 302 ff.) on eternity and creation.

[31] In Ibn Rushd's *Talkhīṣ* (1984a, 183, 15–17, my translation); cf. Endress (1995, 36).

[32] This is also how Wolfson (1929, 596) understood this passage.

is more explicitly hylomorphic), one must presume that he found al-Fārābī's position on this issue noteworthy enough to mention him by name. As we shall see shortly, the connection Ibn Rushd establishes between Alexander, Themistius, and al-Fārābī vis-à-vis the problem of celestial matter is substantiated both historically and doctrinally: the former by what we know of the transmission and reception of the texts written by these Greek authors in medieval Baghdad, the latter by a comparison of al-Fārābī's, Alexander's, and Themistius' theories of substrate. Hence, Ibn Rushd seems to be well informed both in terms of the historical connection between the Greek and Arabic philosophers and the contents of their works.

On the other hand, what is surprising about Ibn Rushd's report is that it mentions the term "substrate" (*mawḍūʿ*) instead of the term "matter" (*māddah*) to describe al-Fārābī's view. Al-Fārābī's theory as it appears in *Ārāʾ* and *Siyāsah* is that the heavenly bodies are deprived of "matter," but not of a certain "substrate," which is closely linked with the celestial soul. Moreover, al-Fārābī employs the concept of substrate to show that the celestial substance is composite, not simple (ch. 3, 2.7.). Ibn Rushd could not have failed to grasp these points had he read al-Fārābī's emanationist works carefully. This raises the obvious question of which Fārābīan work Ibn Rushd had in mind when making this statement. This question is all the more valid given that Maimonides refers in *Guide* to al-Fārābī's *Physics*, a work which is no longer extant and which seems to have contained doctrines that differ quite importantly from those articulated in al-Fārābī's later works.[33] In spite of this, Ibn Rushd appears to use the two terms 'substrate' and 'matter' synonymously in this passage, and his report informs us that all of these thinkers, i.e., Alexander, Themistius, and al-Fārābī, agreed in depriving the celestial bodies of material substrates or of any kind of material composition.

1.2.3. *Conclusion*

The previous survey of celestial matter in the Fārābīan corpus and in later reports has brought to light several discrepancies and indicates

[33] Ibn Rushd's statement that "there is no disagreement among the commentators [*al-mufassirīn*]" indicates that he may be referring to one of al-Fārābī's commentaries, possibly the latter's no longer extant commentary on *On the Heavens*. However, since the view that the heavenly bodies lack a material substrate is also clearly developed in the mature emanationist treatises, it is also possible that Ibn Rushd had these works in mind.

that al-Fārābī's doctrines on this issue are not homogeneous. In his curricular works and in his summaries of Aristotelian philosophy, al-Fārābī discusses celestial matter in a way that is quite germane to the aether theory of *On the Heavens*, although he omits the Arabic terminology usually associated with this concept and also introduces minor modifications.[34] According to these works, the celestial bodies are made of matter (*māddah*), even though this matter is different from the one of sublunary bodies. This special matter is presumably incorruptible—although al-Fārābī does not specify this himself—and it is also characterized by circular motion. Explicit references to *On the Heavens* are made in these works.

In the emanationist treatises, in contrast, al-Fārābī refrains from ascribing any kind of matter (*māddah*) to the heavens, and he introduces the concept of substrate (*mawḍūʿ*) instead. He does not mention *On the Heavens* at all. One notices a clearly definable trend in *Ārāʾ* and *Siyāsah* to minimize the association between the heavenly bodies and matter and even to present them as non-material entities. Finally, the evidence that can be gleaned from later sources seems to intensify these discrepancies: while Ibn Rushd refers to al-Fārābī's view that the celestial bodies lack substrate and, therefore, matter, Maimonides quotes al-Fārābī's commentary on *Physics* as upholding a theory of multiple types or degrees of celestial matter.

But more should be said about how al-Fārābī handles this issue in the emanationist treatises. On the basis of these texts, we may conclude either that the heavenly bodies have no matter at all or that they possess a special matter that is essentially different from that of perishable beings.[35] On the one hand, al-Fārābī holds that all bodies are composed of form and matter, two of the six principles that make up his ontology.[36] Since the orbs and planets are bodies (*ajsām*), they should accordingly be hylomorphic. Al-Fārābī claims that the heavenly bodies emit

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[34] I borrow the expression 'curricular works' from Reisman (2005, 69, note 9) to refer to those works in which al-Fārābī exposes the doctrine of other philosophers, especially Aristotle, and in which he describes the scientific curriculum he inherited from the Alexandrian tradition.

[35] This dual conclusion is quite close to the way in which Themistius interpreted Aristotle's aether. In a passage of his paraphrase of Book Lambda preserved in Hebrew, Themistius (1999, 122) writes: "Il faut en effet, ou bien, que l'on dise qu'ils [the celestial bodies] n'ont pas de matière du tout, ou que l'on dise que la matière qui est la leur est autre que la matière des choses qui admettent la génération et la corruption."

[36] These principles are enumerated at the beginning of *Siyāsah*; see al-Fārābī (1964, 31).

light and possess the best corporeal qualities, which also implies that they are material.[37] On the other hand, he says virtually nothing in his emanationist treatises about the nature of celestial matter, but instead seems to replace matter with a new concept of immaterial substrate. He defines the celestial bodies essentially as intellectual beings closer to the divine realm than to the world of material and corporeal existents. How, then, is one to interpret this doctrine of celestial substrate?

One may justifiably argue that al-Fārābī's failure to mention aether or to articulate a coherent theory of celestial matter does not stand as sufficient proof that he believed the heavens to be immaterial. After all, Proclus sometimes calls the heavenly bodies "immaterial" (ἄυλον), although in other instances he endows them with a material substrate made of a refined version of the elements, especially fire.[38] Accordingly, al-Fārābī's statement in *Siyāsah* that the celestial substrates are "not matters" (*laysat mawādd*) could be interpreted as meaning simply that they are not composed of the four elements fire, air, earth, and water, but not that they are literally immaterial. While possible, this reading does not agree with the accumulated evidence presented above, and there are several reasons to discard it.

To begin with, al-Fārābī deliberately omits all hylic terms in connection with the heavens (such as *māddah*, *ʿunṣur*, and *hayūlā*), a fact which cannot be merely coincidental. Second, he replaces matter with the concept of substrate (*mawḍūʿ*), which he uses very consistently in both *Ārāʾ* and *Siyāsah* to the exclusion of terms signifying matter. This concept of substrate is conceived of as being semantically broader than the concept of matter, with the result that not all substrates are material. In *Fuṣūl* al-Fārābī distinguishes three classes of beings on the basis of their relation to matter and states: "There are three genera of existing things: those devoid of matter, celestial bodies, and material bodies," to which correspond "three worlds: spiritual, celestial, and material [*rūḥāniyyah wa-samāwiyyah wa-hayūlāniyyah*]."[39] Al-Fārābī therefore makes a clear distinction between the material beings and the celestial beings on the grounds of their relation to matter. Third, while Aristotle and the later Peripatetic tradition regarded aether as a simple substance and the celestial bodies as possessing a homogeneous nature, al-Fārābī's concept of substrate implies the opposite: the celestial bodies are

[37] Al-Fārābī (1985a, 122–123 and 1985b, 70).
[38] Siorvanes (1987, 234–237, 239–246).
[39] Al-Fārābī (1971b, 78 and 2001a, 45).

composite substances, which can be divided into form and substrate. Moreover, unlike aether, which pervades the entire heavens and constitutes the corporeal substance of the orbs and planets, al-Fārābī explains that the celestial substrates are proper to each celestial body and can only receive one specific form, i.e., the soul of this celestial body, thus undermining the idea that the celestial bodies possess a common matter.

Fourth, since the celestial souls are defined by al-Fārābī as intellects, it is inconceivable that they would inhere in a material substrate. In fact, these substrates are presented as being closely related to the celestial rational soul to the extent that one even wonders if they are not to be seen as a part of it, just as al-Fārābī calls *mawḍūʿ* certain faculties of the human rational soul.[40] Finally, whereas aether was connected with the perfect circular motion of the heavens in the Peripatetic tradition—a connection which al-Fārābī makes on behalf of Aristotle in the context of his defense of aether in *Radd*—the emanationist treatises omit any connection between aether and motion, comparable to the one that appears in *On the Heavens* 1.2-4, nor do they stress the kinematic quality of the heavenly substance. Rather, as will be seen in chapter 4, al-Fārābī makes soul the primary cause of motion. All of these factors compellingly point to the conclusion that al-Fārābī departed from the Peripatetic tradition on aether and that he articulated the theory of an immaterial celestial substrate instead.[41]

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[40] See *Fī l-ʿaql*, for example (al-Fārābī 1938, 22).

[41] Walzer in his commentary on *Ārāʾ* (al-Fārābī 1985a, 370, and 375–376) went so far as to ascribe a theory of intelligible matter to al-Fārābī: "Al-Fārābī is quite aware that Aristotle had introduced a fifth element, aether, being the element from which the stars are made, but he deliberately abandoned the Peripatetic dogma by substituting for aether the 'quinta essentia,' the neo-Platonic 'spiritual intelligible matter', the *noētē hylē*, and making it in turn the 'cause' of the four elements." But this interpretation is not without its problems. First, al-Fārābī does not use the standard expressions associated with theories of intelligible matter in the Arabic tradition, such as *ʿunṣur awwal* and *hayūlā ūlā wahmiyyah*. These terms appear, for example, in the doxography of Pseudo-Ammonius (Rudolph 1989, 37) and the *K. al-iṣlāḥ* of Abū Ḥātim al-Rāzī (1998, 39) respectively. In the first work, which ascribes the doctrine of intelligible matter to Empedocles, *ʿunṣur awwal* is described as "the first of the simple intelligible [things]" (*awwal al-basīṭ al-maʿqūl*). Second, Walzer seems to have misunderstood the exact status of intelligible matter in the Neoplatonic legacy that he claimed was bequeathed to al-Fārābī. He unjustifiably equates intelligible matter with celestial matter, thus passing over the fact that for most Neoplatonists intelligible matter is *not* the matter of the heavens. According to Plotinus, for example, the heavens are made of a pure kind of fire, but intelligible matter belongs to the intelligible world that is emanated directly from the One and represents a proto-stage of the formation of the Intellect.

At first glance al-Fārābī's reticence to ascribe any kind of matter to the heavenly bodies appears as an unexpected and intriguing departure from most of the Greek cosmological traditions of antiquity. These had developed various different theories of celestial matter: it could consist of aether (Aristotle), of a refined version of the four elements with a predominance of fire (Plato, Proclus, Simplicius), or even of the same elements as those that exist in the sublunary world (Philoponus). Regardless of the differences between their views, these thinkers ascribed some kind of materiality to the heavens, including Philoponus, who rejected Aristotle's cosmology and mounted the most serious rebuttal against it. One of the basic premises of these views is the correlation between perceptibility and materiality. Accordingly, the stars and planets are perceptible bodies and so they must be composed of matter, everything that is perceptible to the senses being material. Aristotle articulates this idea clearly in *On the Heavens* when he writes: "Now since the universe is perceptible it must be regarded as a particular; for everything that is perceptible subsists, as we know, in matter."[42] Several centuries later, Philoponus reiterates this point in his attack against a group of unnamed philosophers. He writes: "it is quite ridiculous … to say that the heavens are immaterial [ἄυλον]. For they are not intelligible, but perceptible."[43] Philoponus' tone is denigrative, but his statement testifies that the idea of an immaterial heaven was not unknown in antiquity.

What is more, al-Fārābī's position seems to depart from that of his predecessors in the Arabic tradition. Al-Kindī, for instance, refers several times to the fifth substance of the heavens in his corpus[44] and

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Hence, for Plotinus, intelligible matter pertains to the level of the Intellect, whereas celestial matter is emanated from the Soul and is situated below it in the hierarchy of being. This is also how most thinkers in the Arabic tradition seem to have understood intelligible matter: they make it an emanation of the First Cause, sometimes even, as in the case of the *Doxography* of Pseudo-Ammonius, the very first intelligible being to proceed from God. The entry on Empedocles in this work reads: *fa-abdaʿa l-shayʾ al-basīṭ alladhī huwa awwal al-basīṭ al-maʿqūl wa-huwa l-ʿunṣur al-awwal* (Rudolph 1989, 37). That Walzer's theory contains a flaw in this regard cannot be ignored.

[42] *On the Heavens* 1.9.278a11 ff. (translated by Stocks in Aristotle 1941). See also *Metaphysics* 1.8.990a1-5.

[43] In Philoponus' *Against Aristotle,* as reported by Simplicius in his *On the Heavens* commentary, 133,21–29. It is likely that Philoponus' criticism is addressed to Proclus and other Neoplatonists, who often describe the heavens as being immaterial (ἄυλον).

[44] See al-Kindī (1950–53, vol. 2, 55), Atiyeh (1966, 73–74), and Adamson (2007a, ch. 4).

provides a definition of matter in his *Risālah fī ḥudūd al-ashyāʾ* that stresses a literal understanding of celestial hylomorphism. In the latter treatise, al-Kindī writes that "*falak* [the celestial orb] is matter [*ʿunṣur*] which has a form [*ṣūrah*]."[45] This definition proves that he perceived the celestial bodies as hylomorphic beings. Ibn Sīnā and Maimonides, to name but two major post-Fārābīan thinkers, also stress the hylomorphic nature of the heavens and talk at length about the matter (*māddah*) of the orbs.[46] Al-Fārābī's views contrast singularly with those of these other Arabic thinkers.

Al-Fārābī therefore departed from one of Aristotle's core cosmological tenets in his emanationist treatises. In doing so, he was continuing an ancient exegetical tradition on aether that had generated a wide variety of interpretations regarding the exact nature of celestial matter. In some cases, the departure from Aristotle had been so drastic that thinkers such as Xenarchus in the Peripatetic school, Plotinus, and later on Philoponus felt entitled to challenge the seminal views of the Stagirite on aether.[47] Al-Fārābī perpetuates these exegetical efforts in his own works, thereby inscribing himself in this long philosophical tradition and demonstrating a willingness to put forth innovative interpretations regarding ideas he inherited from past thinkers.

To recapitulate, then, the previous analysis has led to a distinction between three very different theories of celestial substance, which correspond to a three-fold division of the Fārābīan corpus: the first one consists of *Fuṣūl*, *Ārāʾ*, *Siyāsah*, to which should also be added Ibn Rushd's quotation; the second one consists of *Iḥṣāʾ*, *Falsafat Aristūṭālīs*, and *Radd*; and the third one is represented by Maimonides' quotation referring to al-Fārābī's commentary on *Physics*. When one takes into

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[45] Al-Kindī (1950–53, 169). Al-Kindī further defines *ʿunṣur* as the "matter of all matter," a formula which is tantalizingly reminiscent of the Pseudo-Empedoclean sources, but which in this context probably refers to the physical, concrete matter of all corporeal things. Al-Kindī also uses the plural *ʿanāṣir* to refer to the four elements fire, air, earth, and water in his *K. fī ibānah*, 219–220. That al-Kindī uses the same term to signify both terrestrial elements and the matter of the heavenly orbs is interesting, and may betray the influence of Philoponus, who held the view that the heavens were made of the same elements as sublunary beings, albeit of a purer kind.

[46] See Ibn Sīnā's *Al-samāʾ wa-l-ʿālam* in *Shifāʾ* (1983–1986, 15,6; 30, passim; 31,2–3), *Risālat al-ʿulwiyyah* (id. 1908, passim), *Najāh* (id. 1985, 313), the *Metaphysics* of *Shifāʾ* (id. 2005, 312, 324, 330, 331, 334), and M. Rashed (2004, 41). For Maimonides, see Wolfson (1929, 103, 605–606) and Glasner (2000).

[47] For an overview of this exegetical tradition, see Sambursky (1962, 124–127, 154 ff.), Wildberg (1988), Verrycken (1990b), and M. Rashed (2004).

account some of the other findings reached in the previous sections of this book, one can reconstruct three main theories of celestial substance in al-Fārābī's works, which can be organized as follows:

1) *Ārāʾ* and *Siyāsah* a) equate the souls of the heavenly bodies with their forms; b) combine them with a non-material substrate; c) and use analogical language to describe the heavens, which both emphasizes their remoteness from the sublunary world and at the same time offers a convenient means of comparing the two.[48]
2) These points, which do not appear in any other work by al-Fārābī, are opposed to the more 'standard' descriptions of aether given in *Iḥṣāʾ*, *Falsafat Arisṭūṭālīs*, and *Radd*, which a) explicitly mention the matter (*māddah*) of the heavens and omit to mention substrate (*mawḍūʿ*); b) mention celestial form, but neither equate the celestial soul with form, nor mention the soul of the heavenly bodies in this context; and c) shun analogical language.
3) Finally, there is the theory of various grades of celestial matter that Maimonides ascribes to the Second Teacher in his *Physics* commentary, which is derived from the observation of the various degrees of transparency of the heavenly bodies.

While several hypotheses can be proposed to explain these discrepancies, the most convincing one, in my opinion, is the hypothesis of an evolution in al-Fārābī's conception of this cosmological problem. In this view, al-Fārābī's theories evolved over time, and he composed these works during different periods of his life. The main argument supporting this developmentalist approach so far is a chronological one: there is a correspondence between the hylic theories exposed in al-Fārābī's works and the dating of his corpus. It is generally held that *Ārāʾ*, *Siyāsah*, and *Fuṣūl* belong to a late phase in the Second Teacher's life.[49] In contrast, it is reasonable to surmise that most of al-Fārābī's commentaries on the Aristotelian corpus, such as his commentaries on *Physics* and

[48] Mahdi (2001, 4) writes that "the cosmology and the politics presented in them [*Ārāʾ* and *Siyāsah*] differ in the two works." In spite of Mahdi's claim, al-Fārābī's descriptions of the heavenly bodies show a remarkable degree of consistency. This suggests that these treatises were composed during the same period.

[49] See Dunlop (in al-Fārābī 1961b, 9–17) and Alon (2002, vol. 2, 824–826), who notes that Dunlop, Najjar, Rosenthal, and Walzer all agree that these works are al-Fārābī's last compositions; see also Galston (1990, 4, note 2), who provides a clear overview of past scholarly opinions on the topic, as well as Reisman (2005, 54–55) and Gutas (1982a); finally, Vallat ("L'intellect selon Fārābī: la transformation du savoir en être," 7, forthcoming) considers *Ārāʾ*, *Siyāsah*, and *Fuṣūl* to be late compositions.

On the Heavens, as well as his curricular works and summaries of Aristotelian philosophy (*Iḥṣāʾ*, *Falsafat Arisṭūṭālīs*), were produced during an earlier phase, when he was studying Aristotelian philosophy from the perspective of the Alexandrian school tradition and through the mediation of the Christian Aristotelians in Baghdad.

It is striking that the previous classification of al-Fārābī's works based on his doctrine of celestial substance accords with the little that is known about the dating of the Fārābīan corpus. This interpretation has the merit not only of explaining the heterogeneous evidence concerning matter that can be gleaned from the Fārābīan corpus, but also of accounting for the contradictory reports made by later authors such as Maimonides and Ibn Rushd. In order to further strengthen the fundamental hypothesis of an evolution in al-Fārābī's cosmology, I will discuss some of the factors that may have been responsible for this shift in doctrine, and then turn to an examination of al-Fārābī's views on the causation of the material world.

1.3. *Four Explanations of al-Fārābī's Theory of Substrate (mawḍūʿ)*

In the following paragraphs, I examine what I believe are four convincing reasons why al-Fārābī may have engaged in a revision of his early Aristotelian views on the question of celestial substance and developed the concept of substrate (*mawḍūʿ*) in his later works. First, al-Fārābī was positively influenced by the commentaries of Alexander of Aphrodisias and Themistius, which provided him with new exegetical possibilities on the question of celestial matter. Second, al-Fārābī was negatively influenced by the severe criticisms that Aristotle's theory of aether incurred at the hands of Philoponus. In addition, the prevalent Greek and Islamic precedents for the view of a material heaven (notably those of Philoponus and al-Rāzī) would not have been doctrinally acceptable to al-Fārābī, because they clashed with other aspects of his thought. Third, al-Fārābī's emanationist treatises are marked by a depreciation of the principle of matter in general. Fourth, Aristotle's aether was difficult to reconcile with the Ptolemaic theories of celestial motion.

1.3.1. *Substrate (ὑποκείμενον) in the Greek Commentatorial Tradition*

Given that many of al-Fārābī's cosmological views stem from a long philosophical tradition that flourished especially in the late antique world of the Eastern Mediterranean, it is worthwhile examining

whether his theory of celestial substrate had any precedent in the Greek commentaries. The concepts of matter (ὕλη) and substrate (ὑποκείμενον) figure in many ancient debates about the nature of the heavens. They were part and parcel of the Greek philosophical terminology that was transmitted to the Islamic world, even though no Arabic thinker before al-Fārābī makes such ample use of substrate (*mawḍūʿ*) in his cosmology and psychology.[50] This suggests that he was well informed about the philosophical debates of late antiquity and that he knew some of the Greek commentaries written on *On the Heavens*, *Physics*, and *Metaphysics*. A study of the works of the Greek commentators immediately reveals a doctrinal link between al-Fārābī, Alexander of Aphrodisias, and Themistius with regard to these issues. There follows a brief overview of celestial matter in these thinkers' works and its relation to al-Fārābī's cosmology.

The connection between substrate and matter was already made by Aristotle, and these passages provided a starting point for subsequent exegetical elaborations on the issue of celestial matter.[51] Ancient commentators, such as Alexander of Aphrodisias and Themistius, were intent on clarifying the nature of celestial matter as it appeared in the Aristotelian corpus, but in the process of interpreting Aristotle, they often ended up elaborating a different doctrine from that of their master. For instance, Alexander and Themistius sometimes seem to reject the idea that the heavens are material. Building on certain passages of the Aristotelian corpus such as *Metaphysics* 8.4.1044b7-8 in which Aristotle seems to hint at the possibility that the heavens are immaterial, the later commentators developed a new interpretation of celestial substance only loosely based on *On the Heavens* and inspired by other concepts such as substrate and soul.

An example of this kind of exegetical endeavor appears in Alexander's commentary on *Metaphysics*, in which he claims that "the substrate in the divine [bodies] is not matter," and that "the body that moves in a circle is also a natural body, but matter is not the substrate for this body."[52] In another passage dealing with the relation between form,

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[50] As far as I know, al-Kindī does not use the concept of substrate (*mawḍūʿ*) in a cosmological context.

[51] *Physics* 1.6.189a35; *On Generation and Corruption* 2.1.329a30-33; *Metaphysics* 1.2.983a30, 7.3.1029a20-26, and 12.2.1069b3-8.

[52] τὸ γὰρ ἐν τοῖς θείοις ὑποκείμενον οὐχ ὕλη, *CAG*, vol. 1, 22.2–3, translated into English by Dooley (in Sorabji 2005, vol. 2, 369); ἐπεὶ καὶ τὸ κυκλοφορικὸν σῶμα φυσικὸν μέν, οὐ μὴν ὕλη τὸ τούτῳ ὑποκείμενον, *CAG*, vol. 1, 169.18–19, translated into English by Dooley (in Sorabji 2005, vol. 2, 369).

matter, and body, Alexander writes: "In this connection, one might inquire about the forms in the divine bodies, for these forms are neither enmattered nor perishable and are separable in thought from their underlying body."[53] Finally, in *De mixtione*, Alexander writes that "the whole divine body, which is active, is unmixed and unable to be reciprocally acted on by the body acted on by it; for only enmattered bodies can be acted on."[54] As I. Bodnár wrote in his article on Alexander's cosmology, "the celestial element, which Alexander tends to call θεῖον σῶμα, divine body, is removed from the components of the ever-changing sublunary world to the extent that it can be a legitimate question whether the substrate of celestial bodies can be called matter."[55]

Themistius also proposes a similar reading of Aristotle's aether when he writes in his commentary on *On the Heavens*: "The body which rotates has no contrary, as will become clear shortly. Nor does it have any substrate, for elsewhere it was stated that it lacks matter."[56] This view is also envisaged, but not endorsed, in his paraphrase of Aristotle's *Metaphysics*, Book Lambda, where he suggests that the celestial bodies may be pure forms devoid of matter or that they may contain matter only in an equivocal sense.[57] Finally, Proclus also states on numerous occasions that the heavens are immaterial (ἄυλον), although he develops in parallel a theory of celestial matter that is based on Plato's account in *Timaeus* 40A, according to which the celestial bodies are composed of a pure version of the four elements, with a predominance of fire.[58] To my knowledge, however, Proclus does not include substrate in his discussion of the celestial bodies. Hence, the similarities between Alexander's, Themistius', and al-Fārābī's interpretation of celestial

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[53] ἐπιζητήσαι τις ἄν πρὸς τοῦτο περὶ τῶν εἰδῶν τῶν ἐν τοῖς θείοις σώμασιν. ταῦτα γὰρ οὔτε ἔνυλα οὔτε φθαρτὰ καὶ χωριστὰ τῇ ἐπινοίᾳ τοῦ ὑποκείμενου αὐτοῖς σώματος, *CAG*, vol. 1, 375.37–376.2; translated into English by Dooley (in Sorabji 2005, vol. 2, 369).

[54] *De mixtione*, 229.3–9, translated into English by Todd (in Sorabji 2005, vol. 2, 366).

[55] Bodnár (1997, 190).

[56] *CAG*, vol. 5, 14.12–15, in the Latin version, translated into English by Sorabji (in Sorabji 2005, vol. 2, 369, translation revised). This statement could be the one Ibn Rushd had in mind when discussing the concept of substrate among the commentators in his *Middle Commentary on On the Heavens*.

[57] Themistius 1999, 10.12, 122: "Il faut, en effet, ou bien, que l'on dise qu'ils [the celestial bodies] n'ont pas de matière du tout, ou que l'on dise que la matière qui est la leur est autre que la matière des choses qui admettent la génération et la corruption."

[58] Siorvanes (1987, 234–237, 239–246).

substance are striking and suggest that al-Fārābī may have derived his theory of immaterial substrate from these thinkers.[59]

It is unlikely that Alexander's and Themistius' interpretations are faithful to Aristotle's view on aether as exposed in *On the Heavens*. Nevertheless, they represent interesting cosmological developments in late antiquity.[60] In this connection, however, how literally should one construe Alexander's statements that the celestial bodies are immaterial? Could the heavenly body consist of another type of matter? In other instances Alexander and Themistius seem to posit the existence of some kind of matter in the heavens that they associate with the potency of motion in place. For example, in *Quaestiones* 1.10 and 1.15, Alexander argues that the heavens are material, albeit made of a matter which shares nothing in common with sublunary matter: he therefore posits the existence of two matters, one sublunary, and one heavenly.[61]

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[59] My analysis of the link between al-Fārābī and the Greek commentators should ideally be complemented by a study of al-Fārābī's interpretation of *On the Heavens*. There is a twofold problem, however: first, al-Fārābī's commentary on *On the Heavens* has not survived; second, there is no reliable edition of the Arabic translation of this work made by Ibn al-Biṭrīq. Yet it is likely that a close examination of the doctrines conveyed in the Arabic *On the Heavens* could yield interesting information concerning the cosmology of the *falāsifah* in general and al-Fārābī's theory of celestial substance in particular. An indication of this is Endress' statement (2007, 346) that Ibn al-Biṭrīq's version "gave a specifically Neoplatonic slant to the Aristotelian text: rendering Aristotle's θεῖον σῶμα by *al-jirm al-karīm* or *al-jirm al-rūḥānī*, 'the noble, spiritual body.'" For more information on the Arabic *On the Heavens*, see Endress (1966).

[60] Not only does Aristotle describe aether as the "first body," but in *On the Heavens*, 1.9.278a11 he clearly correlates perceptibility and materiality when speaking about the heavens. Indeed, without matter, the motion of the orbs would be difficult to explain. Simplicius argues in his commentary on *On the Heavens* (*CAG*, vol. 7, 133,29 ff.) that by "immaterial," these philosophers really mean to say that celestial matter is different from and "surpasses" the matter of generation and corruption. However, this interpretation seems to be influenced by his own view on the topic, which makes a serious concession to the 'materialistic' understanding of celestial matter as defended by Philoponus.

[61] See Fazzo (2002, 113 ff.). Fazzo provides an in-depth analysis of Alexander's views on celestial matter in *Quaestiones*. Although she emphasizes the complexity of the topic and acknowledges the contradictions between Alexander's views in his commentary on *Metaphysics* and in this work (123), she does not attempt to explain this discrepancy. But it should be stressed that the authorship of *Quaestiones* is uncertain, and so this raises the possibility that the theories expressed in them are not those of Alexander. See also Bodnár (1997, 190–191, and notes 3 and 4). In any case, only fragments of *Quaestiones* were translated into Arabic, and there is no indication that 1.10 and 1.15—the two sections that focus on the question of celestial matter in most detail—were among the passages translated. On the other hand, the translation of at least parts of Alexander's commentary on *Metaphysics* is attested by Ibn al-Nadīm. The aim here is not to provide a detailed account of Alexander's and Themistius' views, but rather to show that they could have served as a starting point for al-Fārābī's own elaboration.

This conflicting evidence makes it difficult to reconstruct Alexander's position on celestial matter and raises the question of whether he actually held a consistent position on this issue throughout his life. In any case, the important point for my argument is that some of Alexander's and Themistius' views were likely known to al-Fārābī as a result of the Greek to Arabic translation movement and probably served as the starting point for his own interpretation of this problem. Alexander's comments on celestial matter and substrate in particular may have opened new perspectives for al-Fārābī's interpretation of Aristotle's *On the Heavens*.

There is, however, a significant difference between Alexander's and Themistius' views on celestial matter, which should be underlined due to its connection with al-Fārābī's theory. Themistius not only believes that the heavens are immaterial, but he also seems to exclude the possibility of their having a non-material substrate, since he equates substrate with matter. He writes: "Nor does it [the celestial body] have any substratum, for elsewhere it was stated that it lacks matter."[62] Alexander, on the other hand, explicitly refers to a celestial substrate that is not material, but which is meant to act *as* matter for the celestial bodies. He thus replaces celestial matter with celestial substrate, while maintaining a conceptual distinction between the two. As Alexander explains in his *Metaphysics* commentary, "the term 'substrate' [*to hupokeimenon*] has greater extension than the term 'matter' [*hule*], for the substrate in the divine [bodies] is not matter."[63] On the issue of celestial matter, then, Alexander's and al-Fārābī's interpretations are strikingly similar. Both reject the straightforward notion that the heavens are material, and both use substrate (ὑποκείμενον/*mawḍūʿ*) as a substitute for matter. Substrate in their philosophy is conceptually broader than matter, since some things can have a substrate without having matter.[64]

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[62] In his commentary on *On the Heavens*, *CAG*, vol. 5, 14,12–15; cf. Sorabji (2005, vol. 2, 369).

[63] *CAG*, vol. 1, 22,2–3, translated by Dooley (in Sorabji 2005, vol. 2, 369). See also Fazzo (2002, 123). Alexander does not specify in this passage what the nature of this substrate is. But since he equates the nature of the celestial bodies with their soul, it may be hypothesized that his notion of substrate should be construed in light of his psychology. Accordingly, it could be somewhat similar to the potential intellect in humans, which, while immaterial, acts as a substrate for the intelligible forms.

[64] In *Fī l-ʿaql*, al-Fārābī explains that the "substrates [*mawḍūʿāt*] on which the Agent Intellect acts are either bodies or powers [*quwan*] in bodies" (1938, 33–34, my translation). From this passage, it may be inferred that the concept of substrate is broader than the concept of body and that some substrates may be *in* bodies without necessarily

In addition, both Alexander and al-Fārābī seem to reject any correlation between celestial matter and celestial motion.[65]

The previous analysis strongly suggests a link between Alexander, Themistius, and al-Fārābī on the question of celestial matter and substrate. This connection acquires additional plausibility when one takes into account the fact that many of Alexander's and Themistius' works were translated into Arabic. These include the former's commentary on, and the latter's paraphrase of, Book Lambda, as well as Themistius' paraphrase of *On the Heavens*.[66] Furthermore, the Arabic translators of these works were in direct contact with al-Fārābī, who gravitated around their circle. Thanks to Ibn al-Nadīm, we know that Mattā ibn Yūnus translated part of Alexander's and Themistius' commentary on and paraphrase of *Metaphysics* respectively and that the latter translation was copied and perhaps corrected by Yaḥyā ibn ʿAdī.[67] Now it is noteworthy that both Mattā ibn Yūnus and Yaḥyā ibn ʿAdī were close acquaintances of al-Fārābī: the former was an older colleague and possibly his teacher in Baghdad, while the latter was his foremost student. For this reason, it is not surprising to find a passage in Mattā ibn Yūnus' preserved commentary on Aristotle's *Physics* 2.7-9 that shows a marked similarity with the Greek commentators' and al-Fārābī's views on celestial substance. In his answer to a question addressed to him concerning Aristotle's theory of the four causes, Mattā ibn Yūnus says:

> The sun and man are equally one and the same with respect to the form of body [that is, inasmuch as they are bodies], but the sun is bereft of all

being material. Accordingly, al-Fārābī claims that each faculty of the human soul may be seen as a "substrate" (*mawḍūʿ*) for the faculty above it, including the various levels of the intellect (1938, 22).

[65] For Alexander, see Bodnár (1997, 190, note 1); for al-Fārābī, see chapter 4 of this study on celestial motion.

[66] Badawī (1987, 114, 117–118) and Luna (1989, 250). Some aspects of this transmission, however, are complicated. First, there is no way of knowing if the idea of an immaterial heaven was developed in Alexander's commentary on *On the Heavens*, since it has survived neither in Greek nor in Arabic. As for the works by Alexander previously discussed, Ibn al-Nadīm mentions only Alexander's and Themistius' commentaries on Book Lambda of *Metaphysics*, and al-Fārābī in *Aghrāḍ* confirms that his knowledge of their commentaries was limited to this book. He writes: "there is an incomplete commentary on Book Lambda by Alexander of Aphrodisias and a complete commentary by Themistius" (McGinnis and Reisman 2007, 78). There is, therefore, no direct evidence that al-Fārābī had access to Alexander's entire commentary on *Metaphysics*, although this possibility cannot be excluded.

[67] Ibn al-Nadīm (1970, vol. 2, 606).

> other causes, because it is unaffected by whatever it affects *since it has no matter* [*hayūlā*]*; however, it has something like matter* [*lākin lahā shibh bi-l-hayūlā*]—where 'matter' is that which is susceptible to affectation—and so it might receive the transmitted form that is simple.[68]

Two points are of interest here. First, there is the parallel between Mattā ibn Yūnus' statement concerning the immateriality of the sun and Alexander's and al-Fārābī's belief that the celestial bodies are not material. Second, one notices that Mattā ibn Yūnus and al-Fārābī share a common analogical language to stress that the heavenly bodies are made of something that is "like" or "resembles" (*shibh bi*) matter.[69] The similar contents and style of their statements on celestial matter, the close historical link between Mattā ibn Yūnus and al-Fārābī, and the former's role in the translation of Greek commentaries—including some by Alexander—definitely point to a continuous exegetical trend stretching from Alexander to the Baghdad philosophers of the tenth century.

1.3.2. *Philoponus and Abū Bakr al-Rāzī on Matter*

Al-Fārābī may also have reacted against some of the theories elaborated by his Greek and Arabic predecessors. Philoponus, al-Kindī, and Abū Bakr al-Rāzī, whose works were probably well-known to al-Fārābī, developed very different doctrines of matter in their cosmologies. But these models presented serious obstacles to al-Fārābī's commitment to the eternality and causality of the world and matter in his late metaphysical works. The incompatibility of these thinkers' doctrine of matter with al-Fārābī's mature metaphysics may have prompted him to move away from the commonly held notion of the materiality of the heavens and to adopt a different exegetical approach, which was partially suggested to him by the *Neoplatonica arabica* and by Alexander's and Themistius' commentaries.

Philoponus in particular may have had a strong impact on the Second Teacher, who was well acquainted with his criticism of Aristotle's cosmology. As C. Wildberg explains, the *Against Aristotle* shaped

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[68] Arisṭūṭālīs (1964, vol. 1, 139) and McGinnis and Reisman (2007, 123, my emphasis, translation slightly revised).

[69] The similar terminology, and especially the term *shibh*, used by Abū Bishr and al-Fārābī to compare the celestial substance to sublunary matter and their agreement that the heavens are not strictly speaking material indicate a direct link between these two thinkers on the issue of celestial matter.

subsequent debates over the creation of the world in Islam.[70] Muslim and Christian theologians, whose views were often indebted to Philoponus' arguments, also debated the theory that the heavens are made of a different matter from that of the sublunary world. Most Muslim theologians held the view that the heavens are material, yet they ascribed neither eternity nor incorruptibility to this matter. According to the occasionalists, the world is composed of atoms that are reorganized at each instant through divine power.[71] The celestial world does not escape God's fiat and is essentially composed of the same elements as the sublunary world. Hence, the Aristotelian dichotomy between an incorruptible heaven and a lower world of change and corruption is rejected, as is the notion of a simple heavenly substance.[72]

Al-Fārābī surely had to contend with the views of Philoponus and the *mutakallimūn*. We know that he responded to Philoponus' critique of Aristotle's cosmology in several of his works, including in his no longer extant commentaries on *Physics* and *On the Heavens*, as well as in *On Changing Beings* and in the still extant *Radd*.[73] That al-Fārābī devoted such effort to refuting Philoponus' views shows that these must have played an important role in the development of his own cosmological ideas, possibly inciting him to move away from Aristotle's theory of aether in his later years. Philoponus' arguments concerning the corruptibility of the heavens were never endorsed by al-Fārābī, even in *Jamʿ* and *Jawābāt*, which put forth a creationist view. In spite of this, they probably brought to his attention some of the problems inherent in the Aristotelian doctrine of aether.

The second doctrine al-Fārābī may have had to contend with was al-Rāzī's idea of an eternal, uncaused matter. According to al-Rāzī, matter represents one of the five eternal and uncaused principles of the universe, together with time, soul, space, and God. At the moment

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[70] Wildberg (1988, 3). For information on the excerpts of Philoponus' works preserved in Arabic and their impact on Islamic thought, see Kraemer (1965), Davidson (1969), Pines (1972), Hasnawi (1994), Wisnovsky (2001), Hugonnard-Roche (2003, 288–289), and M. Rashed (2004).

[71] For an in-depth treatment of this topic, see Pines (1936) and Dhanani (1994).

[72] Abū l-Barakāt al-Baghdādī, for example, believed that the heavens are composed of several matters, like Maimonides. For the former, see Pines (1979, vol. 1, 170–180, vol. 5, 214–215), and for the latter, Glasner (2000).

[73] The remaining fragments of *On Changing Beings* have recently been analyzed by M. Rashed (2008); for *Radd*, see Mahdi (1967, 236).

of creation, the demiurge allowed soul to mingle with matter, and all the corporeal existents of the universe, including the stars and planets, resulted from this unfortunate alliance. Al-Rāzī defines prime matter (or "absolute matter," *hayūlā muṭlaqah*) before creation as an amorphous mass of atoms. At the moment of creation, this prime matter combines with void to form the bodies of all created beings. At the end of time, all matter will return to this amorphous primal state.[74]

There are a few striking features in al-Rāzī's account that would have been unacceptable to al-Fārābī. The first and most obvious is the idea, directly derived from Plato, of an eternal and uncaused primal matter existing beyond the demiurgic power of God. This view could not be accepted by al-Fārābī, who makes the entire universe and all its existents causally dependent on the First Cause. The second feature of al-Rāzī's account of creation is the homogeneity of matter, the idea that the matter of all beings is essentially the same, i.e., atomistic, and that there is no hierarchy based on hylic distinctions. There is no dichotomy in al-Rāzī's universe between two opposed or essentially different types of matter, terrestrial and heavenly.[75] This again is alien to al-Fārābī's Aristotelian division of the cosmos in two distinct entities, the higher level of the eternal heavenly bodies and the lower level of perishable beings. In this respect, al-Rāzī's doctrine also contrasts with its Platonic source, since Plato establishes a qualitative difference between the heaven and the sublunary world on the basis of a hylic hierarchy.[76] Finally, al-Rāzī's idea that all matter is resolved into absolute prime matter at the end of time does not fit into al-Fārābī's eternalist framework as exposed in the emanationist works. In fact, al-Fārābī is supposed to have written a treatise refuting some aspects of al-Rāzī's

[74] For al-Rāzī's metaphysics, see Pines (1936, 49), Gaudefroy-Demombynes (1941), Fakhry (1968), and McGinnis and Reisman (2007, 44–49), who translated later Arabic accounts on al-Rāzī's philosophy.

[75] This view shares affinities with the prime matter of the Ikhwān al-Ṣafāʾ and of many Ismāʿīlī thinkers. Although prime matter in their philosophy does not consist of atoms, it represents the material matrix out of which all the heavenly and terrestrial existents are made. At first glance, al-Rāzī's doctrine of matter appears to be close to the *kalām* doctrines of occasionalism and atomism, but it diverges from them radically in defining prime matter as an eternal, uncaused substance that lies outside the creative power of God.

[76] In the *Timaeus* (31B-32B, and especially 40A) the heavens are said to be made of a pure version of the four elements with a preponderance of fire.

metaphysics, and it is possible that this work focused partially on his theory of matter.[77]

To conclude, it is clear that Philoponus' and al-Rāzī's hylic theories could not be reconciled with some of the basic physical and metaphysical tenets of al-Fārābī's philosophy. Whether in the polemics of Philoponus and the *mutakallimūn* or in the Platonizing model of al-Rāzī, the prevailing theories of a material heaven presented insurmountable philosophical difficulties for al-Fārābī. They required drastic concessions at the metaphysical level, such as the belief in the uncaused status of prime matter (al-Rāzī), the intrinsic perishability of the heavens (Philoponus), or the non-eternity of the world (al-Kindī). The blatantly 'materialistic' theory of celestial substance upheld by these thinkers—elemental for Philoponus, aetherial for al-Kindī, and atomistic for al-Rāzī—may have prompted al-Fārābī to move away from these trends and to minimize the materiality of the heavens in his later emanationist treatises. Hence, it is not surprising that al-Fārābī opted for a different solution, which relied on the commentaries of Alexander, Themistius, and on the *Neoplatonica arabica*. By introducing the concept of an "immaterial" substrate and by emphasizing the noetic nature of the heavenly bodies, al-Fārābī bypassed the problems he perceived in these thinkers' hylic doctrines as well as their criticisms of Aristotle's views.

1.3.3. *Prime Matter and Heavenly Substance: The Baseness of hayūlā*

The status of prime matter in al-Fārābī's philosophy deserves investigation, because it bears a direct link to the problem at hand. Regardless of whether ancient Greek and medieval Arabic philosophers established a radical or relative difference between heavenly and terrestrial matter, many of them agreed in establishing prime matter as the source principle out of which all types of matter arise, including celestial matter. This is the case, for example, of Philoponus, who develops a concept of prime matter as three-dimensional corporeal extension, and which therefore encompasses the celestial bodies within its scope.[78]

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[77] This work is mentioned by al-Qifṭī in *Taʾrīkh al-ḥukamāʾ* (al-Qifṭī 1903, 280) under the title *Al-radd ʿalā l-Rāzī* and by Ibn Abī Uṣaybiʿah (1965, 608) under the title *Kitāb al-radd ʿalā l-Rāzī fī l-ʿilm al-ilāhī*; see also Najjar (2004, 31).

[78] For Philoponus' conception of prime matter, see de Haas (1997) and the relevant sections in Sorabji (2005, vol. 2); for his theory of celestial matter, see Sambursky (1962, 154 ff.), Wildberg (1988, 187–236), and M. Rashed (2004).

For al-Rāzī, ultimate prime matter is not substantially different from the atomic matter that constitutes the things of the earth and heavens. As for Ibn Sīnā and Ibn Rushd, they develop a theory whereby prime matter and the corporeal form are at the basis of all corporeal existents, including the celestial bodies.[79] The Ismāʿīlī and Pseudo-Empedoclean traditions also establish a direct connection between prime matter and celestial matter, the former being the matrix out of which all the corporeal beings—both heavenly and sublunary—are formed.[80]

Al-Fārābī, in contrast, has a completely different view on the subject. Prime matter in his system is exclusively confined to the sublunary world, where it serves as the source out of which the four elements arise; it has no role whatsoever in the superlunary world. A clear indication of this is that its very existence is dependent on the rotating activity of the celestial bodies, which are explicitly described as the causes of the existence of prime matter. In *Siyāsah*, for example, al-Fārābī writes: "The substance, nature, and activity of the celestial body is such that there immediately follows from it the existence of prime matter [*al-māddah al-ūlā*]."[81] This view is reiterated in *Fī l-ʿaql*, when al-Fārābī writes: "Indeed it has been ascertained in the book entitled *On Generation and Corruption* that the celestial bodies are the first efficient causes of these [sublunary bodies] and it is them therefore that provide the Agent Intellect with the matters and substrates in which it acts."[82] According to al-Fārābī, then, prime matter is not a cause or principle for the celestial bodies; rather, it is the celestial bodies themselves and their circular motions that cause its

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[79] Wolfson (1929, 100–104), Hyman (1977 and his comments in Ibn Rushd 1986, 29–32); and Stone (2001).

[80] For a brief overview of prime matter in Arabic philosophy, see Gardet *EI*^{2}. The idea that prime matter is one of the highest ontological principles can be found in many Ismāʿīlī, Pseudo-Empedoclean, and early doxographic sources. In some cases, prime matter is even described as an intelligible principle or an intelligible form emanating directly from the One or the Intellect. See Abū Ḥātim al-Rāzī (1998, 30–31); the entry on Empedocles in the *Doxography of Pseudo-Ammonius* (in Rudolph 1989, 37). Jābir ibn Ḥayyān's view seems quite unique, although it also posits one source for all matter. He makes substance or dust (*al-habāʾ*) the stuff out of which everything is made (see Haq 1994, 55). *Theology of Aristotle* also presents a similar view: "all bodies, by reason of their being bodies, are of one matter [*min hayūlā wāḥidah*]"; "… because the matter of all bodies is one" (Badawī 1977b, 126 and Lewis 1959, 183–185). A quick glance at these sources suffices to stress the gap between their conception of prime matter and al-Fārābī's.

[81] Al-Fārābī (1964, 55).

[82] Al-Fārābī (1938, 33–34).

existence.[83] While this theory does not in itself imply the immateriality of the heavens, it suggests that al-Fārābī sought to distance himself from what appears to have been a relatively common position in Greek and Arabic thought, namely, that prime matter is the ultimate principle for the materiality of all things, including the celestial bodies.[84]

One notices a general depreciation of matter in al-Fārābī's emanationist treatises, in a way that sometimes recalls Neoplatonic thought. On one occasion prime matter is described as the basest and "lowest of existents."[85] It is situated below even the simple elements in al-Fārābī's ontological hierarchy. Although al-Fārābī does not equate matter with evil, there is the idea in his works that matter is inevitably accompanied by potency, imperfection, and a base form of existence. The low status of prime matter and matter in general in al-Fārābī's ontology goes hand in hand with his desire to remove the celestial bodies as far as possible from any kind of materiality and substantial imperfection.

Hence, when compared to the views of his contemporaries, such as the Ikhwān al-Ṣafāʾ and Abū Bakr al-Rāzī, Ismāʿīlī thinkers such as Abū Ḥātim al-Rāzī and al-Sijistānī, as well as those in the Pseudo-Empedoclean tradition, and even in comparison to the view of al-Kindī, al-Fārābī's position on the status of prime matter appears unconventional in the Arabic context, yet in a sense closer to Aristotle's original doctrine.[86] Al-Fārābī, unlike these thinkers, relegates prime matter to the very bottom of his ontological hierarchy and establishes a radical dichotomy between prime matter and the superlunary world. One implication is that there is no relation whatsoever between prime matter and the substance of the celestial bodies. The further implication is that the substance of the celestial bodies is not only different from sublunary substances, but it cannot in any way be derived from prime matter or a material principle either, since al-Fārābī does not explicitly

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[83] That prime matter is restricted to the sublunary world is explicitly stated in *Siyāsah*: *fa-l-māddah al-ūlā hiya bi-l-quwwah jamīʿ al-jawāhir allatī taḥta l-samāʾ* (al-Fārābī 1964, 54).

[84] The causedness of prime matter in al-Fārābī's and Ibn Sīnā's philosophies was already noticed by Duhem (1913–59, vol. 4, 474, 488–490), who nevertheless does not explain its relation to the matter of the heavenly bodies. See also Davidson (1992, 47–48).

[85] Al-Fārābī (1964, 58). This bi-polar ontological hierarchy with the First at one end and prime matter at the other is reminiscent of Proclus.

[86] This conclusion may be reached in spite of the fact that scholars still disagree on the exact nature of prime matter in Aristotle's philosophy. For an incisive discussion of this question, see Charlton (1992, 129–145), who also provides a useful summary of the previous scholarship on the topic (146–147).

posit another source for matter apart from prime matter. Accordingly, the cause emanating from the separate intellects and responsible for the existence and corporeality of the celestial orbs is not described as a material cause. This raises the intriguing question of how al-Fārābī's cosmology accounts for the perceptibility and corporeality of the heavens and the fact that they possess qualities, such as motion, sizes and volumes, and luminosity, traditionally attributed to bodies.

1.3.4. *Aether and Motion*

Finally, a word must be said about the relation between aether and the Ptolemaic theories of celestial motion. As chapter 2 showed, al-Fārābī adopts the main features of Ptolemaic planetary theory, including the eccentrics and epicycles. On the other hand, he may have perceived an inherent tension between Aristotle's aether theory and the Ptolemaic model, that is, between the idea exposed in *On the Heavens* 1.2-4 of a fifth nature possessing inherent circular motion and the existence of multiple and different celestial movements. In this respect, al-Fārābī could have been influenced by some passages of Philoponus' *Against Aristotle*, which uses the Ptolemaic theories of eccentrics and epicycles to undermine the notion of a special element possessing a propensity for regular, circular motion. As R. Sorabji writes, "he [Philoponus] also exploits the theory of epicycles, worked out by Hipparchus and Ptolemy, to argue that since they make celestial motions eccentric and complex, the case for the fifth element, with its simple rotation, is already refuted."[87]

Evidence for this is mostly of a negative nature: in his personal works al-Fārābī never establishes a correlation between celestial matter and celestial motion, and thus avoids explaining the movements of the orbs by reference to material causes.[88] His account, as we shall see in chapter 4, is exclusively based on the qualities of the celestial souls and in that sense perpetuates the 'vitalist' or 'psychological' trend adopted by many Neoplatonists before him. One may surmise that the difficulty involved in reconciling the kinematic implications of aether and

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[87] In Philoponus (1987, 22).

[88] Al-Fārābī's treatise *Radd* establishes a correlation between aether and circular motion (see al-Mahdi 1967, 253–254), which is nonetheless made on behalf of Aristotle. The Second Teacher's aim in this treatise is clearly apologetic, i.e., to explain Aristotle's theory of the elements and defend it against what he sees as an unjustified attack mounted by Philoponus. More will be said about this treatise in section 2.1.2.

the Ptolemaic planetary theories represents yet another reason for al-Fārābī's reticence to adopt a clearly recognizable aether theory in his emanationist treatises.[89]

2. *The Origin of Matter: From Creationism to Eternal Causation*

The previous section clarified al-Fārābī's views on the celestial substance and also introduced the hypothesis of an evolution in his perception of this issue. In the remaining part of this chapter, I will address another key issue connected with celestial matter, namely, its origin and how it is caused to exist. We shall see that the developmentalist hypothesis that has been sketched above is also supported by the evidence in al-Fārābī's corpus concerning the relation between matter and creation.

The problem of how al-Fārābī approaches the question of the creation of matter should be contextualized in terms of the legacy of Greek thought on the one hand and the Arabic-Islamic theological background on the other. More precisely, it is linked to the issue of the creation or eternity of the universe. This debate was already acute in the late antique Greek tradition and found a remarkable embodiment in the works of Proclus, Philoponus, and Simplicius. However, it acquired a new meaning in the Islamic milieu as a result of certain developments proper to this civilization, such as the appearance of an influential class of theologians (*mutakallimūn*) at a social level and the emphasis on the absolute unity of God and His transcendence from the world at a creedal level.

As it stands today, the Fārābīan corpus adopts two 'paradigmatic' interpretations concerning the origin of the material world. The first is based on the concepts of absolute creation out of nothing and on the world's temporal finitude; the second, on the concepts of atemporal causation and the eternity of the physical universe. I use the word 'paradigm' in order to stress the pre-existent conceptual framework these interpretations imply, as well as to emphasize the fact that they are mutually irreconcilable and rely on fundamentally different premises.

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[89] It should be noted, however, that Ptolemy himself perceived no contradiction between aether and the observed diversity of planetary motions, since he refers to and endorses a variant of aether in his astronomical works; see for instance *Almagest* 1.3 H14.

This means that al-Fārābī had to abandon the first paradigm in order to adopt the second.

At first glance, one may not perceive a strict correlation between al-Fārābī's theories of celestial substance and matter in general and his views on the creation of the world. But in late antique Greek and early Arabic philosophy, these two questions are intimately connected, since the status and nature of (celestial) matter in a thinker's philosophical system depends partly on his perception of how the world was created and vice versa. For example, the postulation of an eternal and uncaused prime matter (e.g., Abū Bakr al-Rāzī) clashed with the *kalām* notions of God's unique eternality and of His absolute demiurgic power. Indeed, the orthodox Christian and Muslim creationist positions make matter a direct effect of God's creative act. Its existence is therefore contingent on divine will and power. For this reason, it is worthwhile asking oneself what the prevailing views on the origin of celestial matter were in the tenth century and how they were integrated in a creationist or eternalist picture. How did al-Fārābī respond to these pre-existing interpretations? And what are the main features that characterize his account? In the following paragraphs, I examine al-Fārābī's views on the existence and creation of matter in his various works and try to identify the sources and intellectual currents that informed them. I will then provide an overarching interpretation of al-Fārābī's intellectual development on this issue.

2.1. *Aether and Creationism: An Exercise in Harmonization*

Two important issues pertain to al-Fārābī's interpretation of Aristotle's theory of aether and how he connected it with the thesis of the eternity of the universe. Al-Fārābī was undeniably acquainted with the Aristotelian tenet that aether is a special, incorruptible element lacking the properties of the sublunary elements. Not only did he write a commentary on *On the Heavens*, but he also discusses this aspect of Aristotle's cosmology in some of his extant works, such as *Falsafat Arisṭūṭālīs*, *Iḥṣāʾ*, and *Radd*.

One point that should be underlined from the outset is that the theory of aether—at least as it is exposed in Aristotle's original cosmological system—would have represented a theoretical obstacle to al-Fārābī's own cosmological and metaphysical commitments and presented him with a fundamental incompatibility. The reason for this is that Aristotle gives no indications in *On the Heavens* or in any other work to the

effect that aether and the heavens are caused and are essentially dependent on higher principles for their existence. Indeed, Aristotle's cosmology has most often been defined by modern scholarship as an eternal system that nonetheless lacks a clear theory of creation or efficient causality.

In al-Fārābī's philosophy, in contrast, all existents, including of course the celestial bodies, as well as the primary elements and prime matter itself, are caused by higher principles. Surprisingly at first glance, al-Fārābī nowhere highlights this as a shortcoming in Aristotle's cosmology. In order to understand why this is the case, one must contextualize al-Fārābī's approach to the Aristotelian works in light of the late antique Greek philosophical tradition. This tradition articulated a new interpretation of Aristotelian cosmology and of the nature and activity of the Aristotelian God by using Platonic concepts and by relying especially on the account of creation found in Plato's *Timaeus*. Through this exegetical device, late antique philosophers managed to supplement a compelling theory of efficient causality to the Aristotelian model, effectively defining the First Unmoved Mover not only as a final cause of motion, but also as an efficient cause responsible for the existence of the world. While this trend may have started with Alexander, it was articulated in its most consummated form by Ammonius, Simplicius, Syrianus, and other late Neoplatonists. It is this well-entrenched commentatorial tradition that al-Fārābī inherited and through which he read and construed Aristotle's cosmology.[90] With respect to celestial physics, this indicates that al-Fārābī's interpretation of the aether theory was significantly different from the original doctrine developed by the Stagirite. While for the latter, aether is uncaused and eternal, or both "ungenerated and indestructible" as Aristotle puts it in *On the Heavens* 1.3.270a13-14, for al-Fārābī on the contrary the celestial substance necessarily has a cause responsible for its existence, even though it may be conceived of as possessing eternal duration.

In view of the foregoing, it is important to realize that al-Fārābī subsumes the question of the causedness of matter under the broader problem of the creation or causation of the universe. Unlike Aristotle, whose discussion of aether appears in his physical works, al-Fārābī's

[90] For the philosophical background to these elaborations, see Verrycken (1990a) and Sorabji (2005, vol. 2, 164–168), and for the Arabic context, Bertolacci (2005a) and Wisnovsky (2003b and 2005).

rare digressions on the celestial substance and matter in general are to be found in a metaphysical context and are usually connected with the causality of the separate intellects or the celestial bodies. This is because al-Fārābī defines matter as one of the existents (*mawjūdāt*) and principles (*mabādiʾ*) of his ontology, which, like all the other entities apart from the First, requires a cause for its existence. Accordingly, if we look at how al-Fārābī deals with the problem of matter throughout his corpus, it readily appears that matter is either subordinated to a creationist account in which the entire universe is produced out of nothing by a Creator God (*Jamʿ*, *Jawābāt*, and possibly *Radd*), or, conversely, it is integrated in a causal scheme that ensures the temporal eternity of matter, but which subordinates it to the causality of higher principles (*Ārāʾ* and *Siyāsah*). My point is that in both cases matter is given an explicit cause and origin for its existence, and therefore the issues of the cosmological status and nature of celestial matter are subordinated to the more fundamental issue of the causation or creation of the world. Hence, the two models that can be found in the Fārābīan corpus (non-eternal creation *ex nihilo* and eternal causation) can be interpreted from the outset as cosmological developments perpetuating the late antique debates and discussions concerning creation and efficient causality in Aristotle's cosmology. As a corollary, and regardless of which paradigm is intended, there can be little doubt that al-Fārābī interpreted the Stagirite as upholding a view on efficient causation and the causedness of matter and the corporeal world that was similar to his. This can be explained either because he assumed that Aristotle, the greatest of all philosophers, could not have failed to develop such a theory and to account for the origin of matter, or more likely because he construed Aristotle's cosmology in light of the late antique (mostly Neoplatonic) commentaries and the doctrines of causation found in the *Neoplatonica arabica*.

But before this aspect of his cosmology is examined in more detail, it should be stressed that the idea according to which al-Fārābī may have articulated over the course of his life two different and conflicting cosmological models is not accepted by all scholars. There is in fact widespread disagreement on this point. Some scholars have explained this apparent contradiction by questioning al-Fārābī's authorship of *Jamʿ* and *Jawābāt*, the two works which explicitly defend a creationist position. M. Rashed has argued in two recent articles that these treatises must be inauthentic, since they convey a view of creation, matter, and time that cannot be reconciled with al-Fārābī's

other works. Although Rashed's contention partly rests on earlier criticism, notably by J. Lameer, his articles nevertheless provide the most detailed and sustained argumentation in support of this revisionist view.[91] Against Lameer and Rashed, other scholars continue to defend the authenticity of *Jamʿ* and underline the many doctrinal and thematic parallels it shares with al-Fārābī's other works.[92] Hence, as the situation presently stands, it appears that evidence both for and against al-Fārābī's authorship can be mustered on the basis of a doctrinal analysis of these treatises, making any final resolution of the debate extremely difficult.

I cannot engage here in a full-fledged discussion of this complicated problem, since this would require an analysis of the entire contents of *Jamʿ* and *Jawābāt* and thus take me too far from the topic at hand. Suffice it to say that the cumulative evidence supporting their authenticity cannot be ignored and renders the attempt to reject them from the Fārābīan corpus premature.[93] In what follows, I propose to focus

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[91] Lameer (1994, 23–39) and M. Rashed (2008, 55–58; 2009). As an alternative to al-Fārābī's authorship, Rashed proposes to attribute *Jamʿ* to either one of the two Ibn ʿAdī brothers, Yaḥyā and Ibrāhīm, but more likely to the latter, who was well acquainted with the Second Teacher. I arrived at a similar conclusion in an earlier article (Janos 2009) regarding the potential role of Yaḥyā ibn ʿAdī in the composition or compilation of *Jamʿ* and *Jawābāt*, and I thus partly share the ongoing scholarly skepticism regarding the authorship of these works. However, unlike Rashed, I also entertained in this article the parallel hypothesis that these works could have been composed by al-Fārābī himself during the early Baghdad phase of his life. This hypothesis will be further explored in the following discussion. As for Lameer, he discusses the authenticity of three works in his book: *ʿUyūn*, *Jamʿ*, and *Jawābāt*. While he defends the authenticity of *ʿUyūn*, he considers *Jamʿ* completely spurious, and argues that *Jawābāt* somehow reflects al-Fārābī's doctrine and may be the work of a student or a later scribe imbued with Fārābīan philosophy. My own assessment of these sources is diametrically opposed to that of Lameer. I believe that a close examination of the cosmology and metaphysics of *ʿUyūn* indicates that it should be attributed to Ibn Sīnā's circle if not to the *shaykh al-raʾīs* himself (see appendix 1). On the other hand, I believe that *Jamʿ* and *Jawābāt* are to be connected with al-Fārābī, either as authentic treatises composed by the Second Teacher or as later redactions, which, nevertheless, convey his original ideas.

[92] See notably Mallet's response to Lameer (in al-Fārābī 1999e, 37 ff.), Martini Bonadeo (in al-Fārābī 2008, 28 ff.), D'Ancona (2010), and Endress (in the preface to al-Fārābī 2008, x-xi, xiii). The latter seems to regard *Jamʿ* as one of al-Fārābī's early works, although he does not provide any arguments to support this view.

[93] This evidence consists, first, of the very 'Fārābīan' themes discussed in this work, such as the various types of discourses and their correspondance to various groups in society, the comparison between religion and philosophy, the religious function of philosophy, and the proper use of certain groups of technical terms, to mention only a few (al-Fārābī 1999e, 136–141); second, of the concept of philosophical harmonization, which, in spite of the claim made by some scholars, is in fact typical of al-Fārābī's approach to philosophy (for explicit statements to this effect, see the end of *Taḥṣīl* and

once more on the cosmological sections of these works in order to provide fresh insight into their contents and sources and comment on some of the conclusions reached by previous studies. This reassessment pertains chiefly to the intellectual affiliations of the author of these works and to his use of the *Neoplatonica arabica*. On these points, my interpretation departs both from that of M. Mahdi, M. Galston, and T.-A. Druart, who believe that al-Fārābī is relying on this corpus for apologetic reasons and with full cognizance of its non-Aristotelian origin, and from that of C. Martini Bonadeo and C. D'Ancona, who regard the *Neoplatonica arabica* as a link connecting *Jamʿ* to al-Fārābī's emanationist treatises and who argue that these works all put forth a similar doctrine of eternal emanation.

One observes that these scholars have relied either on the similarities or dissimilarities that the cosmology of *Jamʿ* bears to al-Fārābī's other works in order to assess its authenticity, thus adopting what is essentially a comparative method.[94] My approach to the problem is somewhat different from the one embraced by these scholars, since in my view the authenticity of *Jamʿ* cannot be decided solely on the basis of how the particular doctrines it puts forth compare to those in

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the beginning of *Falsafat Arisṭūṭālīs* in al-Fārābī 2001c, 50 and 71 respectively, as well as Endress 1991 and Martini Bonadeo's introduction in al-Fārābī 2008). This harmonizing approach is obviously a continuation of the late antique Neoplatonic program, and was a main feature of the thought of Porphyry, Ammonius, and Simplicius, among others (see for instance Baltussen 2010 on Simplicius); third, of the many textual parallels between *Jamʿ* and some of al-Fārābī's other works, especially his logical treatises (see, for instance, Mallet's notes in al-Fārābī 1999e, 161); and fourth, of the unanimous ascription of this treatise to al-Fārābī by Arabic historiographers and Ibn Sīnā. Moreover, there are the affinities between the cosmological views articulated in *Jamʿ* (especially with regard to the creation of the world and matter) and those put forth in other works attributed to al-Fārābī, notably *Jawābāt*, as well as some of his logical treatises. This point will be examined in depth in the following pages and integrated in an overarching developmentalist hypothesis. It must be admitted that since the Arabic tradition unanimously ascribes these treatises to al-Fārābī, and since there are obvious doctrinal parallels between them and the Second Teacher's other works, the onus of proof lies with those who challenge their authenticity. The above remarks are merely meant to remind one of the risk incurred in rejecting *Jamʿ* from the Fārābīan corpus, regardless of whether one accepts the developmentalist framework outlined in the forthcoming discussion.

[94] Thus, while M. Rashed (2009) argues that the cosmological doctrines of *Jamʿ* and *Jawābāt* are radically different from those articulated in al-Fārābī's emanationist works and therefore clearly point to the spuriousness of these treatises, Martini Bonadeo (al-Fārābī 2008, 194 ff.) and D'Ancona (2010) are of the opinion that these doctrines are reconcilable with the emanationist framework developed by al-Fārābī. As will appear clearly later on, I agree with M. Rashed on this point, but unlike him, I do not take this as an indication of the spuriousness of *Jamʿ* and *Jawābāt*.

al-Fārābī's other works. Indeed, doctrinal resemblance or divergence cannot be used in itself as a decisive criterion, since it neglects other factors, such as chronology, intention, or context, which might play a preponderating role. Moreover, this comparative approach has limited explanatory potential, since it does not account satisfactorily for the peculiar features of these works, even if one upholds their authenticity and stresses their connection with al-Fārābī's other treatises.

The approach I will endorse relies instead on the hypothesis of a chronological evolution of al-Fārābī's cosmological works, which is supported by data and evidence independent of *Jamʿ* itself, as has already been shown in the first section of this chapter dealing with celestial matter. In this view, the dissimilarities and discrepancies between *Jamʿ* and the rest of the Fārābīan corpus would indicate a development in al-Fārābī's reflection on these philosophical issues, which can best be explained by some of the historical and cultural circumstances of his time and biographical factors. Throughout the following analysis, I will therefore hypothetically accept the report of traditional Arabic historiographers, as well as the view of many modern scholars, who identify al-Fārābī as the author of *Jamʿ* and *Jawābāt*, and I proceed to a discussion of how these writings explain the origin of the material world. The analysis will in turn enable the elaboration of a new hypothesis concerning the meaning and place of these treatises in the Fārābīan corpus.

2.1.1. *Jamʿ and Jawābāt*

I have already provided a detailed analysis of the main features of the cosmological account in *Jamʿ* and *Jawābāt* in a recent article.[95] In what follows, I emphasize only the key elements that are of importance for the present inquiry. In *Jamʿ*, al-Fārābī adopts a particular position on the issue of the creation of the world, which he also ascribes to Aristotle. Noticeable from the outset is the fact that this treatise deploys a rich array of terms to describe the creator: God is originator (*mubdiʿ*) or originator of all things (*mubdiʿ kull shayʾ*), artisan (*ṣāniʿ*), and creator (*bāriʾ*). The world, including the heavens (*falak*), were created absolutely (*ibdāʿ*), from nothing (*lā ʿan shayʾin* and *lā min*

[95] Janos (2009a); cf. M. Rashed (2009). The present section on al-Fārābī's 'creationist' treatises builds on my article, but also departs from it in many ways, as some of my views on key concepts, especially on the relation between time and creation, have been modified.

shayʾin),[96] all at once (*dafʿatan*), and without time and not over a period of time (*bi-lā zamān*). As in *Timaeus* 38B, time came into being with the universe, and it is defined as the "number of the celestial motion" (*ʿadad ḥarakat al-falak*), which means that it results from and is measured by the constant circular motion of the celestial bodies.

As much of the following discussion with regard to al-Fārābī and other thinkers will focus on the relation between time and creation, it should be emphasized right away that the author's defense for the atemporality of creation does not entail his adherence to a doctrine of eternal creation or emanation. This is obvious from the fact that his intention in this passage of *Jamʿ* is precisely to show that the world is not eternal (*qadīm*), that it was created by a willing God, and that it will be destroyed in the future. Al-Fārābī merely intends to stress the fact that creation itself (*ibdāʿ*) is atemporal and that time begins to exist only with the existence and motion of the celestial orbs. In that sense, absolute creation does not occur *in* (*fī*) time, nor does it unfold *gradually* (*awwalan fa-awwalan*) over a period of time. The argument was clearly intended against the view of certain literalist scholars who interpreted the account of creation in scriptures as a temporal process similar to the generation (*takawwun*) of plants and animals, for instance.[97]

The author of *Jamʿ* asserts that in addition to being created, the world will come to an end and is temporally finite: "whatever comes from a thing will inevitably corrupt [*yafsudu*] and return to that thing," and: "the world is innovated out of nothing and will thus revert to nothing."[98] When combined with the proposition of creation with time, that is, with the view that time has a beginning and is concomitant with the motion of the first body, these statements underscore the finitude and contingency of the corporeal universe and its absolute dependence on the creator. In fact, al-Fārābī criticizes various religious groups for failing to articulate a clear theory of the world's "complete annihilation" (*al-talāshī l-maḥḍ*).[99]

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[96] This expression literally means "not from something," and it has sometimes been contrasted to *min lā shayʾ*. For insight into, and a particular interpretation of, these concepts in the Greek, Jewish, and Islamic contexts, see Wolfson (1970 and 1976, 355 ff.). See also Lizzini (2009) for the Arabic tradition.

[97] Al-Fārābī (1999e, 129,14–17).

[98] Al-Fārābī (1999e, 128–129 and 136–137, my translation): *wa-l-ʿālam mubdaʿ min ghayr shayʾin fa-mālahū ilā ghayr shayʾin*.

[99] Al-Fārābī (1999e, 135).

This creationist picture is explicitly ascribed by the author of *Jamʿ* to the Stagirite, both with regard to Book Lambda of *Metaphysics* and to the spurious *Theology of Aristotle*, here clearly considered a genuine Aristotelian work. When it comes to the creation of matter in particular, the author makes a special point to cite the latter work and to refer to its authority in order to prove the Aristotelian pedigree of this idea:

> it is made clear [in *Theology of Aristotle*] that the Creator created matter absolutely [*abdaʿahā l-bāriʾ*] and from nothing [*lā ʿan shayʾin*], and that it was made corporeal and organized by God and by His will [*ʿan irādatihī*].[100]

The use of the verb *abdaʿa* ("he created absolutely") and the expression *lā ʿan shayʾin* ("not from a thing") indicate that the existence not only of the material world, but of matter *per se* or prime matter is directly dependent on God's absolute creative act. This idea is particularly significant to the author, for he accuses other religious groups (such as the Jews and Mazdeans) of upholding the eternity of matter and of not providing a clear account of its origination. He then adds that this matter was made corporeal (*tajassamat*) and was organized (*tarattabat*) by God in a fashion reminiscent of the activity of the Demiurge in *Timaeus*, suggesting that God is not only responsible for creating matter out of nothing, but also for its harmonious organization into various groups of corporeal existents.[101]

Finally, considerable emphasis is placed on divine will throughout the cosmological passage of *Jamʿ*. God created the world and matter through will (*irādah*), an idea which goes hand in hand with the doctrine of divine knowledge of particulars also defended in this work. In this respect, al-Fārābī describes God as the "ruler" or "organizer"

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[100] Al-Fārābī (1999e, 130–131): *wa-hunāka tabayyana anna l-hayūlā abdaʿahā l-bāriʾ … lā ʿan shayʾ, wa-annahā tajassamat ʿan al-bāriʾ jalla jalāluhū waʿan irādatihī thumma tarattabat*. The citations from *Theology of Aristotle* in *Jamʿ* may have been culled from the *Proclus arabus*; for a discussion of this point and relevant references to the secondary literature, see Aouad (1989, 582).

[101] See for instance *Timaeus* 37D: "he brought order to the universe," and 53B: "the god fashioned these four kinds [i.e., the elements] to be as perfect and excellent as possible." Al-Fārābī mentions *Timaeus* on several occasions in *Jamʿ*. He invokes the authority of Plato, for instance, to explain the necessary existence of an efficient cause for the world's creation (1999e, 132–133). The Platonic connection may also be seen in al-Fārābī's use of the term *ṭīnah*, which may have been influenced by the matter or receptacle (ἐκμαγεῖον) of *Timaeus* 49A and 50C, and which, to my knowledge, is not used by al-Fārābī in his other works (1999e, 133–135). However, *ṭīnah* could also derive from the Qurʾānic *ṭīn*, 3:49, 38:76, etc.

(*mudabbir*) of the world and states that "He is ignorant not even of a grain of mustard seed," an obvious reference to verses from the Qur'ānic *sūrah*s "The prophets" (21.47) and "Luqmān" (31.16). In addition, he writes that "not one part of the world escapes His providence (*ʿināyah*)" and that "the universal providence encompasses the particulars."[102]

Question 9 of *Jawābāt* articulates a view that is strikingly close to that of *Jamʿ*.[103] Its author explains that the entire world is composed of form (*ṣūrah*) and matter (*māddah*), that it was created "all at once and not over a period of time" (*fa-kawnuhū kāna daf ʿatan bi-lā zamān*), in spite of the fact that the beings it contains were created in time (*fī zamān*). In addition, the author clearly states that the world as a whole will undergo corruption (*fasād*), although this passing away, too, will not be a temporal event and will occur instantaneously and all at once. Unlike *Jamʿ*, however, Question 9 of *Jawābāt* develops an argument, or rather a proto-argument, to explain why the world is generated and destroyed. The gist of it is that since the world is composed (*murakkab*) of form and matter, it will undergo dissolution (*taḥlīl* or *inḥilāl*), because every composition undergoes dissolution.

In my article on *Jamʿ*, I analyzed some of the sources underlying these accounts and argued that the cosmogonical views they put forth are indebted primarily to a Greco-Arabic theological tradition as embodied in the works of John Philoponus, as well as to some of al-Kindī's treatises and the *Neoplatonica arabica*. The Philoponian connection can be perceived clearly in the following passage, which belonged to John's work *Against Aristotle*, and which was preserved by Simplicius in his commentary on *Physics*:

> God not only produces the forms of the things directly generated by him, but is believed to originate and to create even matter itself. … Therefore, if the things generated by nature are generated out of existing things, it does not necessarily follow that the things directly generated by God are generated out of existing things as well, given that nature on the one hand needs some time and a process of generation in order to create each of the physical objects and that God on the other hand gives existence to the things directly generated by him without a time lapse and without a process of generation, that is to say without a gradual forming and shaping of the objects. For mere willing suffices for him to give substance to things.[104]

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[102] Al-Fārābī (1999e, 131, 137).
[103] Al-Fārābī (1992, 317–319).
[104] Philoponus (1987, 1141,15–30).

And also:

> For the things created by God immediately are neither generated out of something pre-existent nor by way of a process of generation or a stretch of time. For God brought into existence both matter itself and time simultaneously together with the universe, so that motion did not pre-exist the world in time.[105]

The last point on the creation of time together with the world is explained in more detail in a passage of Philoponus' *Against Proclus*:

> [B]y a temporal beginning I mean, as has been repeatedly stated, not one that has taken place within a part of time, time already being in existence, but [for a thing] to begin existing along with time, which had not previously existed.[106]

These passages contain many of the key points discussed in *Jamʿ* and *Jawābāt*, such as the creation of matter *ex nihilo* and the creation of the world *with* time and not over a period of time, as well as the doctrine of divine will. They are presented in such a neatly condensed form that one may wonder whether these or other similar passages from Philoponus' works were not used as a direct model by al-Fārābī for the composition of his *Jamʿ*. In any case, he seems to have combined these Philoponian ideas with material derived from the late antique philosophical tradition and the *Neoplatonica arabica*, as is suggested by several conceptual and terminological parallels.[107] Yet it should be pointed out that the concepts which *Jamʿ* and *Jawābāt* share with the Arabic Neoplatonic texts—especially atemporal creation 'all at once'—are deployed to express a different view of creation. For in the case of the former, they stress the temporal finitude and contingency of the corporeal world. The world was created all at once by an omnipotent divinity—at which point the heavenly motion and time started to exist—and it will also be destroyed all at once at a fixed point in the future, presumably by the same agent that made it.[108] Conversely, in the

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[105] Philoponus (1987, 1142,21–25).

[106] Philoponus (2005b, 158,25–159,1).

[107] In addition to the excerpt of *Theology of Aristotle* cited above, one may enumerate the following features: the description of God as an efficient cause (*ʿillah fāʿilah*) and the mention of the treatise by Ammonius on this subject; and a common language of creation expressing "absolute creation all at once and not over a period of time" (*ibdāʿ daf'atan bi-lā zamān*). See also Zimmermann (1986, 178 ff.) and Mallet (in al-Fārābī 1999e, 50 ff.).

[108] The idea put forth by some scholars, especially Mallet *EI*^{3}, Martini Bonadeo (al-Fārābī 2008, 194–199), D'Ancona (2010, 889), and Lizzini (2011, 142, note 3), that

case of the *Neoplatonica arabica*, these same concepts are integrated in an eternalist scheme characterized by continuous emanation or creation, with no mention of the world's future dissolution. Accordingly, eternity is embodied in the celestial world, whereas the First is said to transcend eternity itself.[109]

A last point should be addressed: Does *Jamʿ* posit intermediary intellectual beings between God and the corporeal world in a way similar to al-Fārābī's later treatises? Even though it has been construed in this fashion by some scholars, the evidence in this regard is ambiguous.[110] On the one hand, the cosmogonical account of *Jamʿ* does not explicitly mention any other causes of existence apart from God or any intermediaries operating between God and the corporeal world. On the contrary, it emphasizes divine omnipotence and omniscience and God's absolute creative act (*ibdāʿ*), even specifying that God created matter directly. In a passage dealing with the separability of form, the author explains that the divine forms and intelligibles subsist in God's essence, not outside of It like "ghosts" or "spirits" (*ashbāḥ*).[111] In this connection, he also warns that one should not conceive of the realm of intellect (*ʿaql*) as being essentially separate from the Creator.[112] On the other hand, in one passage, al-Fārābī states that Aristotle expounded on "the corporeal and spiritual parts of the world."[113] Although the term *rūḥāniyyah*, "spiritual" or "divine," could be an implicit reference to a level of intermediary intellects, it could

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the cosmology of *Jamʿ* and *Jawābāt* is based on the concept of eternal emanation and is reconcilable with al-Fārābī's later metaphysical works is undermined by this crucial difference. As was made clear, the author of these works argues that the world is temporally finite and will come to an end, whereas al-Fārābī's doctrine of causation as expressed in *Ārāʾ* and *Siyāsah* is to be understood within an eternalist framework. In addition, the terminology used in these works to describe God and creation differs significantly. The main allegiance of the author of *Jamʿ* and *Jawābāt* was not to the *Neoplatonica arabica*—even though he draws on this corpus—but rather to the Philoponian tradition and its rejection of the thesis of eternity. Hence, while I uphold the authenticity of *Jamʿ* and *Jawābāt*, I at the same time recognize their specificity in the Fārābīan corpus and separate them from the later emanationist works.

[109] Badawī (1977a, 4–5).

[110] Such an interpretation was proposed by Fattal (2008, 99 ff.), who argues that al-Fārābī in section 74 of this work treats intellect as a hypostasis or as a separate entity distinct from the divine essence on the Neoplatonic model. However, in this passage, 'intellect' is discussed in the context of human noetics and not as a separate entity that would be distinct from both human beings and the divine essence.

[111] Al-Fārābī (1999e, 147).

[112] Al-Fārābī (1999e, 149–151).

[113] Al-Fārābī (1999e, 133): *ajzāʾ l-ʿālam al-jismāniyyah minhā wa-l-rūḥāniyyah*.

also merely serve to evoke the exalted nature of the superlunary world. Hence, the overall evidence in *Jamʿ* seems to exclude a well-articulated theory of intermediary causation and defines God as the unique cause and creator of the world.

The foregoing remarks underscore the particular view expressed in *Jamʿ* and *Jawābāt* concerning the creation of matter, including the heavens. This account is defined by its compatibility on many points with the orthodox Christian and Muslim cosmogonical position and consists of the following key features: creation of the material world *ex nihilo*—including matter itself, a point emphasized by the author; creation with time, as opposed to both creation in time—time already being in existence—and creation over a period of time—time expressing a process of change such as the growth of a plant; divine will as the reason for creation; and the emphasis on the future finitude and perishability of the world. No intermediate intellectual beings are posited that assist God in the act of creation. This position contrasts on virtually every point with al-Fārābī's mature treatises. In spite of this, one observes that the creationist paradigm exposed in these works fulfills at least one crucial function in the context of al-Fārābī's philosophy: it provides a clear and straightforward account of the origin of matter, and thereby avoids the postulate of an eternal and uncaused material principle, as in Rāzī's philosophy. More specifically, it defines God as the absolute cause of the material world (both superlunary and sublunary, no differentiation between the two is made in this work).

2.1.2. *Radd*

Radd offers additional, but ambiguous information about al-Fārābī's position vis-à-vis Aristotle's aether theory and the debate over the creation of the world, which might very well represent a certain departure from *Jamʿ* and *Jawābāt*. This treatise was written as an attempt to refute Philoponus' critique of Aristotle's theory of the elements in the context of the Christian thinker's broader rebuttal of the eternity thesis in his *Against Aristotle*.[114] Al-Fārābī's argument is that Aristotle's comments about aether and the elements were not intended to prove the eternity of the world (as Philoponus contends), but rather to differentiate

[114] Wildberg (1988 and in Philoponus 1987) has collected and translated all the known fragments of Philoponus' *Against Aristotle*.

between the various simple elements, that is, between the four sublunary elements on the one hand, and the fifth celestial element on the other.[115]

Apart from this straightforward fact, which is stated by al-Fārābī at the beginning of the treatise, this text is particularly difficult to interpret due to its polemical character. According to M. Mahdi, who edited the Arabic version and translated it into English,[116] this treatise argues that Aristotle's *On the Heavens* is essentially a discussion about the elements, which by no means should be construed as defending the uncreatedness and eternity of the world. Accordingly, al-Fārābī intends to undermine Philoponus' criticism by showing that there is no contradiction between aether and the creation of the world, and that these notions can be easily reconciled. As Mahdi writes, "He [al-Fārābī] does not believe that the first body as established by Aristotle is necessarily incompatible with the doctrine of the creation of the world."[117] This view is echoed by al-Fārābī himself in the first sentence of his work, where he quite surprisingly asserts that "none of Aristotle's statements in *On the Heavens and the World* that John the Grammarian intended to destroy were intended by Aristotle to establish the eternity of the world."[118]

There is, however, a fundamental ambiguity in this treatise, which is not highlighted by M. Mahdi in his introduction, but which was recently pointed out by C. Martini Bonadeo.[119] It concerns al-Fārābī's own intention or *skopós* and his exact doctrinal position vis-à-vis Philoponus' critique of Aristotelian cosmology. Is al-Fārābī's aim in this treatise to defend Aristotle's thesis of the eternity of the world by arguing that, *pace* Philoponus, there is no real link between aether and eternity in *On the Heavens* and that aether is not meant in any way to represent a proof for eternity? Or is his aim to show, like the author of *Jamʿ*, that Aristotle himself held a creationist and non-eternalist doctrine and thus that Philoponus has completely misinterpreted *On the Heavens*?

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[115] It is interesting that the debate thus centers on the notion of *skopós* (aim or intention) of the work, which was also a notion important to Simplicius and many other Greek thinkers. The *skopós* of *On the Heavens* was particularly debated in late antiquity, as is apparent from Simplicius' survey of the issue in the prologue to his *On the Heavens* commentary.

[116] See Mahdi (1967) and al-Fārābī (1972).

[117] Mahdi (1967, 238).

[118] Mahdi (1967, 253).

[119] Martini Bonadeo (al-Fārābī 2008, 192–193); cf. Janos (2009b, 237 ff.).

In other words, is al-Fārābī defending Aristotle from the perspective of an eternalist or a non-eternalist?

The relation between the concepts of eternity, creation, and the incorruptibility of aether are ambiguous in this treatise, to say the least. As Mahdi points out, "Alfarabi does not commit himself either way on the question of the eternity of the world."[120] Although Mahdi does not address this question in depth, he seems to opt for the view that al-Fārābī combined aether with a theory of eternal causation, which would imply that the Second Teacher is defending Aristotle from an eternalist viewpoint.[121] Mahdi may very well be right in construing the text in this manner. This interpretation would connect *Radd* not only to the later emanationist treatises, but also to other no longer extant works, such as *On Changing Beings*, in which al-Fārābī is said to have defended the thesis of the eternity of the world.[122] This would imply that al-Fārābī had departed from the position defended in *Jamʿ* and *Jawābāt* when he wrote this work.

Yet even if one grants the point that *Radd* assumes an implicit eternalist position, al-Fārābī's exact aim remains somewhat obscure. To illustrate this, one may further refine and subdivide the eternalist thesis into three interpretations, an 'exclusive,' an 'inclusive,' and a 'relative' one. According to the exclusive interpretation, al-Fārābī is claiming that there is absolutely no connection between aether and eternity in Aristotle's *On the Heavens*, although Aristotle does uphold the eternity of the physical universe in his other treatises. In this view, Aristotle was an eternalist, but never made the connection between aether and the eternity of the world (including the heavens). Consequently, Philoponus would have completely misrepresented Aristotle's cosmology and his aim in *On the Heavens*, which was merely to describe the specificity of the heavenly element. This interpretation is, however, difficult to

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[120] Mahdi (1967, 252).

[121] Mahdi (1967, 236): "He [al-Fārābī] upholds Aristotle's position that the world as a whole is not subject to generation and destruction. And he reconciles this position with the doctrine of the creation of the world by proposing with Ammonius that Aristotle's doctrine of movement and time does not exclude the possibility that the world as a whole, together with time, were created from nothing by a God who is the world's final and efficient cause."

[122] Ibn Rushd mentions this treatise on several occasions in his corpus. The relevant passages have been collected by Steinschneider (1869/1966, 119–123), but they provide little insight into the original work. M. Rashed (2008) on the other hand furnishes a detailed study of these excerpts and is able to reconstruct some of al-Fārābī's original arguments.

sustain, given the explicit connection between aether and eternity that Aristotle makes in *On the Heavens*, which is obvious to any careful reader of this work.[123] This exclusive interpretation should therefore not be given serious consideration.

The inclusive interpretation, in contrast, is more convincing. It rests on the idea that al-Fārābī acknowledged the connection Aristotle established between aether and eternity, but did not regard aether as a *proof* leading to the proposition of the world's eternity. What al-Fārābī would be criticizing in this case would be Philoponus' erroneous claim that Aristotle intended his theory of aether to stand as a demonstration (ἀπόδειξις/*burhān*) of the world's eternity. This is apparently how M. Rashed understands al-Fārābī's aim, and it may very well underlie the latter's statement to the effect that "none of Aristotle's statements in *On the Heavens and the World* that John the Grammarian intended to destroy were intended by Aristotle to establish the eternity of the world."[124] The problem with this approach, however, is that al-Fārābī does not use the Arabic term *burhān* ("demonstrative proof") in this sentence (as one would expect), but rather the term *ithbāt*, which can be translated as "proof," but also simply as "exposition," "establishing that," etc. Hence, this inclusive interpretation is only valid if one construes *ithbāt* in the narrow sense of "demonstrative proof," which is far from clear in this context. In any case, this interpretation again downplays the connection between aether and eternity. For even if Aristotle did not intend his arguments in the opening section of *On the Heavens* as demonstrative proofs strictly speaking, he undoubtedly regarded them as a "confirmation" of the eternity thesis.[125]

Finally, according to the relative interpretation, al-Fārābī accepts the connection between aether and eternity and may even regard the aether theory as a proof, but one which can be applied only to the heavens and not to the entire universe. In this third scenario, he would be criticizing Philoponus' unjustified claim that Aristotle inferred the eternity of the entire universe—and not just that of the heavens—from his doctrine of aether. This interpretation should be compared to what al-Fārābī says

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[123] In *On the Heavens* 1.3.270a12-35 Aristotle explains that the first body or aether is both ungenerated and indestructible, while at 1.3.270b1 ff. he describes its divine nature and refers to the empirical evidence showing that no change takes place in the heavens. See also Wildberg (1988, 12 ff.) on the connection between aether and eternity.

[124] Mahdi (1967, 253); M. Rashed (2009, 78–79).

[125] Wildberg (1988, 14–15).

in some of his logical works concerning the applicability of proofs only to parts of a given inquiry and not to its whole.[126] But it is significant that the arguments al-Fārābī puts forth in his refutation completely avoid any references to eternity and focus instead on Philoponus' discussion of Aristotle's theory of the elements, of the distinction between them, and of their various motions. This approach seems somewhat inappropriate, if one keeps Philoponus' intention in mind. For as al-Fārābī himself admits at the beginning of the treatise, Philoponus' avowed aim is to undermine the Aristotelian thesis of the world's eternity. In that sense, it is particularly perplexing that the Second Teacher does not explain why aether *cannot* be used as a proof to establish the everlastingness of the whole world, even though it does prove the immortality of the celestial bodies.

If al-Fārābī was indeed defending Aristotle from an eternalist perspective, it is difficult to understand why he ignores these points. Following one line of reasoning, he could for instance have explained why aether is not a *proof* for the eternity of the world, why Aristotle preferred to defend the world's eternity using other arguments, and where these arguments are to be found in his works. Yet al-Fārābī does nothing of the sort. What we seem to witness on his part, then, is an endorsement of the aether theory with an adamant effort to cancel its eternalist implications.[127]

In addition to this complex of interpretations from the eternalist perspective, which all seem unsatisfactory, it is possible to construe al-Fārābī's aim and arguments from a creationist angle. This alternative interpretation was briefly discussed by C. Martini Bonadeo in her recent analysis of *Jamʿ*.[128] According to this interpretation, al-Fārābī upholds a

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[126] These passages indicate that al-Fārābī was sensitive to this problem even with regard to the question of the world's eternity, which he mentions explicitly in one of his examples in *K. al-jadal* (1985c, vol. 3, 81,15–82,4, and ch. 1, 3.1 of this book).

[127] This fact seems to have puzzled R. Sorabji, who writes (in Philoponus 1987, 20): "Surprisingly, he [al-Fārābī] thinks that Philoponus is wrong to ascribe to Aristotle belief in the eternity of the physical world." A similar conclusion, but in connection with motion, can be made about al-Fārābī's other critical writings on Philoponus, such as *On Changing Beings*. As M. Rashed (2008, 36) writes, "there is no evidence that al-Fārābī tried to give a *positive* proof of the eternity of the heavens [in *On Changing Beings*]," a fact which M. Rashed describes as a "curious absence." This being said, however, al-Fārābī definitely seems to defend the eternity of motion and time in this work.

[128] See Martini Bonadeo's commentary (in al-Fārābī 2008, 192–194) and D'Ancona (2006, 401–405). Cf. the similar line of thought followed independently by Janos (2009b, 237 ff.) and M. Rashed's criticism (2009, 78 ff.).

creationist position in this treatise and therefore attempts to refute Philoponus' critique on its own grounds. Several hints point to the plausibility of this interpretation. First, and assuming that *Jamʿ* is authentic, al-Fārābī ascribes such a creationist view to Aristotle in this treatise and also presents the problem in very similar terms. Besides, there are many structural parallels between the two treatises. For instance, one finds the following statements in *Jamʿ*:

> It has escaped those who disagree [those who claim that Aristotle asserts the eternity of the world] that, first, what is set forth as an example does not stand as a belief and, also, that Aristotle's purpose in the *Topics* is not to explain about the world; instead, his purpose is to explain about syllogisms composed of widely-held premises.

And:

> What also leads them in this presumption [those who claim that Aristotle was an eternalist] is what he mentions in the book *On the Heavens* about the whole having no temporal beginning, for they presume that he is there speaking about the world's being eternal. That is not the case, since he had already explained in that and in other books about physics and theology that time is only the number of the motion of the celestial sphere and is generated from it.[129]

These two passages of *Jamʿ* are important insofar as they may potentially throw light on al-Fārābī's aim and method in *Radd*. They are particularly close to the opening statement of this treatise mentioned above.[130] In both cases, his aim is similar in that he wants to refute the views of those who wrongly ascribe the eternity thesis to Aristotle on the basis of physical concepts found in *On the Heavens* and other treatises: time in *Jamʿ* and aether in *Radd*. Apart from the very close wording and tenor of these passages, al-Fārābī's strategy in these texts is similar and rests on the premise that these people have misinterpreted Aristotle's aim and method and consequently that they have erroneously inferred their conclusion about eternity. Although al-Fārābī does not mention any name in *Jamʿ*, it is likely that he included Philoponus as one of the thinkers who wrongly claimed that Aristotle was an eternalist. *Radd* may thus be construed as echoing al-Fārābī's warning in *Jamʿ* and as representing a more elaborate attempt to refute Philoponus' position from a creationist perspective.

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[129] Al-Fārābī (2001a, 154).
[130] Mahdi (1967, 253) and note 124.

This interpretation is further supported by another passage in *Jamʿ*, which appears just after al-Fārābī's mention of *Theology of Aristotle* and whose function is to buttress his general claim that Aristotle recognized the existence of a Creator.[131] According to this passage, Aristotle in both *Physics* and *On the Heavens* criticized the view of those who believe that the world came into being "by chance and randomness" (*bi-l-bakht wa-l-ittifāq*).[132] He also highlighted the beautiful order of the various parts of the universe, thereby developing cosmological arguments showing the need for a wise architect. The implication of this passage is clearly that Aristotle defended the existence of the Creator in his physical works, including, and this is important, *On the Heavens*. Hence, the entire Aristotelian corpus, and not just Book Lambda of *Metaphysics*, was geared toward this theological purpose. This in turn enables us to better understand the creationist perspective possibly adopted by al-Fārābī in *Radd*.

It was mentioned above that *Radd* endorses the aether theory, but without accepting its implications vis-à-vis eternity. One need not be surprised by this, for in al-Fārābī's mind the issues of the eternity of the heavens and of the special characteristics of aether may not have been connected. In other words, it is possible that al-Fārābī is combining aether with a non-eternalist creationist picture, a combination which he would also have ascribed retrospectively to Aristotle. That this combination was theoretically possible in Arabic philosophy is demonstrated by al-Kindī, who adopts Aristotle's postulate of a 'first body' or 'fifth element' that is in essence incorruptible, but at the same time subordinates this theory to the more fundamental belief in the creationist act of God.[133] In other words, celestial matter is incorruptible as long as the world exists and up to the point when God destroys it. Despite its special nature and incorruptibility, its existence depends absolutely on the First Principle.[134] Finally, and apart from al-Kindī's precedent,

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[131] Al-Fārābī (1999e, 130–131).

[132] As Mallet notes (in al-Fārābī 1999e, 180, note 2), this may be a reference to *On the Heavens* 3.2.301a10 ff.

[133] See al-Kindī's treatise entitled *On the Proximate Efficient Cause* in McGinnis and Reisman (2007, sec. 12.3, 5) and Adamson (2007a, 86–88).

[134] The parallels between al-Kindī and al-Fārābī on this topic naturally raise the question of influence, which is rendered more complex by the fact that they had access to similar sources, which included, in addition to the Aristotelian corpus, works by Alexander and pseudo-Alexander, *Theology of Aristotle*, and other texts from the *Neoplatonica arabica*. Although al-Fārābī does not mention al-Kindī by name, it is undeniable that his views as expressed in *Jamʿ*, *Jawābāt*, and *Radd* bear some

evidence from the Arabic translations of *On the Heavens* should be taken into account, for it is not implausible that the reconciliation between aether and creation was facilitated by, if not prefigured in, the Arabic versions of this work.[135]

If we accept the creationist, non-eternalist interpretation of *Radd* articulated above, then al-Fārābī's cosmological theories in *Jamʿ*, *Jawābāt*, and *Radd* would be similar: he would, following al-Kindī, combine a creationist and non-eternalist view of the universe with a theory of incorruptible celestial matter. This interpretation seems reinforced by the fact that al-Fārābī does not uphold the corruptibility of heavenly matter in any of his works, even in *Jamʿ* and *Jawābāt*, where he seems to defend the creation of the world *ex nihilo*. In these treatises, he explains that the world will be destroyed all at once and in no time, thus cancelling the possibility that the heaven will slowly decay due to the corruptibility of its matter. On this point, both al-Kindī and al-Fārābī depart from Philoponus, who exerted considerable energy to refuting Aristotle's theory of aether and to showing that the heavenly substance is perishable by nature and composed of the same elements as sublunary bodies. It would seem that throughout his corpus, and

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resemblance to al-Kindī's cosmological doctrines. More specifically, al-Kindī's works may have been the source for al-Fārābī's reconciliation of a version of aether and creation during this period of his life. However, the possibility that the two thinkers independently reached a similar position by relying on identical sources cannot be excluded.

[135] At first glance, creation *ex nihilo* and the Arabic *On the Heavens* would seem to have little in common, but a detailed study of the doctrinal variations between the Greek and Arabic versions is required in order to answer this question. If one may rely on the edition prepared by Badawī, aether is described as follows: "it is necessary to consider that this noble body [aether] is neither generated nor corrupts"; and "as for this first noble body it did not originate from anything" (*wa-ʿalā hādhā l-mithāl bi-ʿaynihī yanbaghī an yuʿtaqada anna hādhā l-jirm al-karīm ghayr kāʾin wa-lā fāsid*, and *fa-ammā hādhā l-jirm al-awwal al-sharīf fa-lam yatakawwan min shayʾ albattatah*) (in Badawī 1961, 139–140). The first quotation closely follows the original text of *On the Heavens* at 270a13 ff., which reads: "It is equally reasonable to assume that this body will be ungenerated and indestructible" (translated by Stocks in Aristotle 2001). But it is possible that some Arabic readers understood the gist of these passages and especially the term "ungenerated" not in the sense that aether is an eternal *and* uncaused substance, but rather that it is a substance that is not generated over a period of time, as are certain sublunary bodies, for instance, and that it is not a substance generated *out of* or *from* (*min*) something else. In other words, it would seem that, in spite of stressing the ingenerabillty and incorruptibility of aether, these passages could be reconciled with the doctrine of creation all at once and in no time. Judging from al-Kindī's dual theories of creation and aether, it is most likely in this fashion that he read *On the Heavens*.

even in his creationist works, al-Fārābī never adopted the Philoponian view of the intrinsic corruptibility of celestial matter.

This interpretation would also enable us to understand why al-Fārābī in *Radd* simultaneously refutes the correlation made by Philoponus between aether and eternity, and yet defends the existence of the fifth element as expounded by Aristotle in *On the Heavens*. While in agreement with Philoponus on the question of creation, al-Fārābī opposed him on the question of aether, which, like al-Kindī, he managed to reconcile with his cosmogonical account. The irony is that al-Fārābī's account of creation during this early phase was itself deeply influenced by Philoponus. It is precisely because al-Fārābī was able to reconcile these two ideas (creation and aether) and attributed this view to Aristotle, that he misunderstood Philoponus' attack on Aristotelian cosmology, which rested upon the correlation made between aether and eternity.[136]

If the previous interpretation is correct, then one would have to connect *Radd* to *Jamʿ* and *Jawābāt*. Indeed, an eternalist reading of *Radd* is discouraged by the parallels between this treatise and *Jamʿ* and by the peculiar insistence al-Fārābī shows to dissociate aether from eternity. There is another hint suggesting the correctness of this approach: the theory of celestial substance in *Ārāʾ* and *Siyāsah*—treatises in which al-Fārābī upheld an eternalist position—is very different from the one that appears in *Radd*. As we have seen, by the time al-Fārābī was writing the emanationist treatises, he had definitely moved beyond an Aristotelian conception of aether. This important observation suggests that these works belong to a different period in al-Fārābī's life from the one to which *Radd* belongs. Hence, in tenor, intention, and content, *Radd* is much closer to *Jamʿ* than it is to the

[136] This interpretation of *Radd* naturally raises the question of al-Fārābī's knowledge of the contents of *On the Heavens*. It is possible that some of the crucial passages in al-Fārābī's version of the Arabic *On the Heavens* connecting aether with eternity were left out, adapted, or modified by the translators, so that the compatibility between aether and creation was foreshadowed in this text. A clearer knowledge of the Arabic versions of *On the Heavens* accessible to al-Fārābī would in any case go a long way in explaining the formation of his cosmogonical views. The problem is that the Arabic translations of *On the Heavens* have not yet been properly edited, and little work on this seminal text has been conducted. The edition published by Badawī (1961) is generally considered unreliable. Endress (1966) represents the only general study of the transmission of *On the Heavens* and its reception in the Arabic world. Further research on this subject is a *desideratum*.

emanationist treatises. Although the previous interpretation should be regarded as a tentative one, in the absence of additional evidence concerning *Radd*, it helps us to maintain a broader interpretive framework and to insert this treatise in the developmentalist perspective previously outlined.

2.2. *Iḥṣāʾ and Aghrāḍ: Two Transitional Works?*

2.2.1. *Iḥṣāʾ on Metaphysics and Creation and its Relation to Jamʿ*

Al-Fārābī's *Iḥṣāʾ* is an interesting work, which has nevertheless not attracted much scholarly attention and remains poorly studied and understood. Its general aim is to offer a systematic description of the philosophical curriculum by enumerating the different sciences, their parts, and their subject matter. It is clearly inscribed in the tradition of Alexandrian philosophical teaching, as Gutas stressed,[137] but it also contains other features that are characteristic of the Arabic intellectual context in which it was composed. It is precisely on these features that I wish to focus, especially al-Fārābī's description of metaphysics (*al-ʿilm al-ilāhī*), which appears after his treatment of mathematics and physics, and which shows a high degree of similarity with the creationist position articulated in *Jamʿ*.[138]

In this section, al-Fārābī identifies three parts that constitute metaphysics, the first two of which (the study of beings and their accidents, and the quest for the first principles of the sciences) are not immediately relevant to my purposes. Rather, it is the third part I am interested in. It is by far the most extensive of the three and focuses on the aspect of metaphysics that investigates theological or divine matters, i.e., it deals with the immaterial existents that lie beyond the physical investigation. A close examination of this passage reveals that it may be divided further into three shorter sub-sections. In sub-section 1 (99,14-100,6), the author explains that metaphysics examines whether any immaterial beings exist, and if so, their number, whether they are infinite, etc. He also explains that this part of metaphysics proceeds up the ontological ladder through demonstrations to establish the existence of a perfect immaterial being above which no other and more perfect being can exist, and that this being is the First (*al-awwal*). This is clearly

[137] Gutas (1983).
[138] Al-Fārābī (1949, 99–101).

a summary of Aristotle's *Metaphysics*, Book Lambda, which deals with the unmoved substances and asserts the existence of the First Unmoved Mover. Then follows sub-section 2 (100,7-13), which focuses on the nature of the First and especially on Its being a cause of existence (*wujūd*), unity (*waḥdah*), and reality or truth (*ḥaqq*) in all the other beings. This sub-section, which already introduces the theme of procession, goes beyond Book Lambda and relies substantially on other, Neoplatonic sources. Finally, sub-section 3 (100,13–101,10) witnesses the identification of this deity with Allāh and provides an account of Its actions and Its creation of the other existents.

This breakdown of the text shows clearly that according to al-Fārābī, theology or divine science represents only one part (*qism*) of metaphysics, which is nonetheless the principal objective or aim (*gharaḍ/skopós*) sought in this science. As A. Bertolacci has shown, this view is inscribed in the Alexandrian Neoplatonic tradition, especially in the Ammonian tradition of metaphysical studies.[139] This focus on the theological aim of metaphysics in turn explains why al-Fārābī devotes so much space to describing the third part and its various sub-sections and why he begins the opening sections of *Ārāʾ* and *Siyāsah* with a discussion of the immaterial and divine entities.[140]

Now, one detects significant terminological and conceptual parallels between *Iḥṣāʾ* and *Jamʿ*, which are crucial for our understanding of how *Iḥṣāʾ* fits in al-Fārābī's intellectual development, and which

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[139] Bertolacci (2006, 76, and 79 ff.).

[140] Consequently, Druart's (2005, 334) suggestion that al-Fārābī is exposing in the third, theological part of the *Iḥṣāʾ* survey all the metaphysical issues that he plans to tackle and that he believed were left unaddressed by Aristotle seems improbable. If this were true, then it would imply that al-Fārābī believed Aristotelian metaphysics to be limited exclusively to the general study of existents and their accidents and to the search for the first principles of the sciences, and never to have included theology and the immaterial existents as part of its subject matter, even though it represents the ultimate objective of this science in al-Fārābī's view. But as the above division of the text shows, sub-section 1 of part three, which deals with theological matters and the immaterial beings and whose inquiry culminates with the postulation of the First, is clearly a summary of Book Lambda. More generally, al-Fārābī never explicitly criticizes Aristotle's alleged metaphysical shortcomings in any of his works. Finally, there are strong reasons to believe, as *Jamʿ* has already indicated, and as will be shown shortly in the case of *Iḥṣāʾ* as well, that al-Fārābī regarded the inquiry into procession or the downward movement away from the First as belonging to Aristotle's metaphysics as well. As a result, the reason why al-Fārābī dwells on the theological part of metaphysics is precisely because he thought it had been covered in depth by Aristotle and represented the crowning achievement of this philosopher's system.

indicate that this work probably belongs to his creationist phase as well. The terminology used by al-Fārābī to define the highest divinity, its nature, and its creation, borrows extensively from the theological domain and shows a clear overlap with the creationist treatises. The divinity is "the First" (*al-awwal*), "Allāh the exalted" (*Allāh ʿazza wa-jalla*), who possesses "attributes" (*ṣifāt*) and "divine names" (*taqaddasat asmāʾuhū*), who performs "acts" (*afʿāl*), who "created the existents" (*al-mawjūdāt allatī khalaqahā*), and "from whom the existents were originated" (*kayfa ḥadathat al-mawjūdāt ʿanhu*).

Al-Fārābī does not rely here on the specific terminology of causation that is prevalent in his later metaphysical treatises and which will be analyzed later on in detail. In this connection, one also notices that al-Fārābī virtually ignores the separate intellects or *thawānī*, a theory which will form the cornerstone of his mature cosmological system. The only potential reference to such intermediary beings (99,16) is vague and limited to the statement that the immaterial existents identified by metaphysics are multiple (*kathīrah*). This statement appears in the context of al-Fārābī's description of Book Lambda and the 'ascending' metaphysical inquiry in sub-section 1, but it plays no role in his description of the rest of metaphysics in sub-sections 2 and 3. This omission is all the more surprising, given that these sub-sections focus on procession and on the First's relation to the other beings. Hence, instead of the multi-layered account of causation one finds in the later works, there is an emphasis in this text—especially in sub-section 2—on the oneness and unicity of God as Creator and on His being a source of unity and existence for all the other beings, as if He were the only cause operating in the superlunary world. This is another conspicuous feature that *Iḥṣāʾ* shares with *Jamʿ*.

Moreover, al-Fārābī betrays in these two texts an identical understanding of Aristotelian metaphysics, which in his view may be divided into an "ascending part," which proceeds through demonstrations to establish the existence and oneness of God and which is contained in Book Lambda, and a "descending part," which examines God's relation to the other beings *qua* Creator and His role as a cause of existence and unity for these beings. This latter part is discussed in the *Neoplatonica arabica*, which al-Fārābī obviously includes in the Aristotelian metaphysical corpus, even though he does not mention it by name. A comparative table is provided below that highlights the key terms and shows the degree of overlap between *Iḥṣāʾ* and *Jamʿ*:

Jamʿ	*Iḥṣāʾ*
Section 57: Having introduced these premises, he [Aristotle] then proceeds upwards [*yartaqī*] to the discussion of the corporeal and spiritual [or immaterial, *rūḥāniyyah*] parts of the world … in his books [lit. "letters," *ḥurūf*] on metaphysics, Aristotle proceeds upward [*yartaqī*] from the necessary and demonstrative premises to the exposition in Book Lambda of the unicity of the Creator.	Sub-section 1: He [the metaphysician] then demonstrates that they [i.e., the various different classes of immaterial beings] on account of their multiplicity proceed upward [*tartaqī*] from the basest to the nobler, until they arrive at the last [i.e., God], which is perfect and in comparison to which nothing more perfect can exist.
He then proceeds downwards [i.e., from the First to the lower existents] and returns to an exposition of the soundness of his previous premises until they are treated in detail [*ilā an yastawfīhā*].[141]	Sub-section 2: He then examines after that all the remaining things by which God is described until they are treated in detail [*ilā an yastawfīhā kullahā*].
	Sub-section 3: He then examines the order of all of Its [the First's] remaining acts on the existents until they are treated in detail [*ilā an yastawfīhā kullahā*].

[141] Mallet (in al-Fārābī 1999e, 183, note 3) interprets this passage of *Jamʿ* as referring to the "last" book of *Metaphysics*, by which I assume he means Book M, whose contents are described by al-Fārābī in *Aghrāḍ* (1999c, 38,5–6). While possible, this suggestion seems highly unlikely, first, because al-Fārābī has just mentioned and discussed *Theology of Aristotle* in the preceding section as a genuine Aristotelian work, and second, because Books M and N focus mostly on mathematical objects and the forms. Hence, one hardly sees how, in al-Fārābī's view, these books could have provided an adequate and detailed discussion of the relation between the individual substances and God, especially since al-Fārābī follows Aristotle in rejecting the extramental existence of mathematical objects and locates the forms in the divine essence in *Jamʿ*. The comparative table above shows that the parallels between *Jamʿ* and *Iḥṣāʾ* cannot be merely coincidental. Since the *Theology of Aristotle* underlies the metaphysical account provided in *Iḥṣāʾ*, the same would appear to be true for *Jamʿ* as well, which otherwise explicitly ascribes this work to the Stagirite. Hence, the evidence overwhelmingly indicates that al-Fārābī is referring to *Theology of Aristotle* and perhaps to other works from *Neoplatonica arabica* when he mentions the descent from the First in this passage of *Jamʿ*.

He then shows clearly that all of them [the existents] were originated from [*ḥadathat ʿan*] the absolute creation of the Creator.	He then explains how the existents originated from [*ḥadathat ʿan*] Him [God].
Section 56: Aristotle showed in his book entitled *Theology* that the One exists in all multiplicity . … He [Aristotle] then shows that [*thumma yubayyinu anna*] the True One [*al-wāḥid al-ḥaqq*] is that which endows the other existents with unity [*afāda sāʾir al-mawjūdāt al-waḥdiyyah*].[142]	He then shows [*wa-yubayyinu anna*] … that He [God] is Truth [*wa-annahū huwa l-ḥaqq*] … that He is the One and First that endows all things except Himself with unity [*huwa l-wāḥid al-awwal alladhī afāda kull shayʾin al-waḥdah*].

The above analysis and textual comparison demonstrate clearly the overlap in phrasing, contents, and outlook between *Iḥṣāʾ* and *Jamʿ*. In view of this, we may formulate some important conclusions. First, the results show convincingly that al-Fārābī considered Aristotle's metaphysics to consist both in the investigation leading upward to the First or God *and* in the investigation of how the First or God relates to the other beings, bestows unity and existence on these beings, as well as how It created the world. According to al-Fārābī, these two aspects of Aristotelian metaphysics were embodied in *Metaphysics* Book Lambda and in some works of the *Neoplatonica arabica* respectively, especially in *Theology of Aristotle*. In this regard, *Jamʿ* outlines the Aristotelian metaphysical project in a clear fashion, marking both stages of the metaphysical inquiry, and identifying the texts that correspond to them. *Iḥṣāʾ*, which was obviously modelled closely on the account in *Jamʿ*, was written with this outline in mind: sub-section 1 corresponds to the upward investigation of Book Lambda, whereas sub-sections 2 and 3 correspond to the investigation going from the First to the other existents. One of the upshots of this conclusion is that, in spite of the view held by Mahdi, Druart, and others, al-Fārābī clearly was not aware

[142] Although this section precedes the one above it in *Jamʿ*, I have decided to place it after al-Fārābī's exposition of Aristotelian metaphysics in section 57 for the sake of a clear comparison with *Iḥṣāʾ*.

of the true origin of *Theology of Aristotle* and perceived it together with *Metaphysics* as forming an integrated metaphysical corpus, which he ascribed as a whole to Aristotle. This is stated explicitly in *Jamʿ*, and it is unmistakably the premise on which the entire account of *Iḥṣāʾ* is written.[143]

Second, the terminological and conceptual parallels between *Iḥṣāʾ* and *Jamʿ* clearly point to a common period of composition for these texts, which most likely corresponds to what I shall call 'al-Fārābī's early Baghdad phase.' *Iḥṣāʾ* both continues the Alexandrian philosophical tradition and also contains many idiosyncratic features—especially with regard to its adoption of the creationist paradigm already identified in *Jamʿ*, *Jawābāt*, and *Radd*—two aspects which can best be explained by the influence of al-Fārābī's Christian teachers. This coheres with the fact that *Iḥṣāʾ* projects a picture of the Alexandrian philosophical curriculum as it was transmitted and adapted by the Christian Syriac tradition to which al-Fārābī's teachers belonged. The classification of the sciences proposed in *Iḥṣāʾ*, the emphasis on philosophical harmonization in *Jamʿ*, and the intention of elucidating the theological aim (*gharaḍ/skopós*) of metaphysics in *Iḥṣāʾ* and *Aghrāḍ* (more on this treatise below), are all aspects that connect these works with the Alexandrian philosophical legacy that was revived in Baghdad. However, they possess a new *raison d'être*, which is to naturalize philosophical praxis in the Islamic context and to show the inherent harmony between religion and philosophy. More specifically, they express key religious doctrines in philosophical language.[144] The foregoing suggests that these works were in all likelihood composed

[143] It is, I believe, in reaction to the works of some of the first scholars of Islamic intellectual history, such as B. Carra de Vaux and T. de Boer, that Mahdi, Druart, Galston, and others, made adamant efforts to argue that al-Fārābī clearly distinguished Aristotle's true writings from the *Neoplatonica arabica* and had a lucid conception of Aristotelian metaphysics. This reaction is understandable, as it may have seemed improper to uncritically endorse a thesis associated in many ways with a biased and Eurocentric kind of scholarship. But the evidence adduced above indicates convincingly that, in spite of obvious shortcomings, the view of these early scholars should be taken seriously. At least during his 'early Baghdad phase,' al-Fārābī attributed *Theology of Aristotle* and other Neoplatonic works to Aristotle and perceived Aristotelian metaphysics as a comprehensive discipline dealing with both the ascent to the First and Its creation of the other existents.

[144] With regard to *Iḥṣāʾ*, the above analysis thus agrees with the conclusion of Gutas (1983, 260), reached through a study of the logical contents of this work: "Logic and grammar, philosophy and religion, are shown by al-Fārābī to be *complementary* parts of the *same* system, not posited as *contradictory* parts in two *different* systems."

when al-Fārābī was studying in the circle of the Syriac scholars in Baghdad.

Finally, and as a corollary, in both *Iḥṣāʾ* and *Jamʿ* the *Neoplatonica arabica* are used to buttress a creationist position that is compatible with religious dogma. This creationist position displays a unique intertwinement of elements drawn from both the theological tradition and from the Arabic Neoplatonic works. God is defined as the First Principle, which confers oneness to all beings, but He is also a Creator God that creates the world absolutely—*khalaqa* in *Iḥṣāʾ*, *abdaʿa* in *Jamʿ*—and which is explicitly identified with Allāh. This creationist connection is further strengthened by the common statement in *Jamʿ* and *Iḥṣāʾ* that the existents are "originated from" (*ḥadathat ʿan*) God, a verbal formula that never appears in al-Fārābī's later metaphysical writings to define the activity of the immaterial entities. While al-Fārābī explicitly attributes this cosmogonical position to Aristotle in *Jamʿ*, *Iḥṣāʾ* provides valuable additional evidence that he endorsed it himself. In addition, the two texts define God similarly as the giver of unity (*waḥdah*) in addition to existence (*wujūd*) to all beings. In this respect, *Jamʿ* and *Iḥṣāʾ* use the idiosyncratic expression "the True One" (*al-wāḥid al-ḥaqq*) or a variant of it to describe God, with explicit reference to Aristotle in the former case. This expression appears frequently in *Theology of Aristotle*, thereby lending more weight to the hypothesis that this Neoplatonic source influenced both metaphysical accounts.[145]

But unlike *Jamʿ*, which is ambiguous on this point, *Iḥṣāʾ* is also noteworthy in that it explicitly identifies "multiple" (*kathīrah*) immaterial beings, thereby indicating that al-Fārābī at this stage in his life may have endorsed the theory of an intermediary level of immaterial existents between God and the world. As we have seen, however, this did not prevent him from defining God as the sole creator and cause of the cosmos, and the causative role he ascribes to these existents seems to have been minimal. This in turn might suggest a certain departure from the cosmogonical model of *Jamʿ* and *Jawābāt*, but the similarities between these works are in any case stronger than their differences. Hence, we may conclude that *Iḥṣāʾ* was written from a similar philosophical standpoint and belongs to al-Fārābī's creationist phase together with *Jamʿ*, *Jawābāt*, and probably *Radd*.

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[145] Badawī (1977b, 135,11–12 and passim).

2.2.2. *Aghrāḍ*

This treatise is ambiguous and not easily classifiable. On the one hand, it bears striking terminological and doctrinal parallels with the creationist treatises, especially *Iḥṣāʾ*. On the other hand, its extreme brevity prevents a definitive conclusion as to how it may relate to the rest of the Fārābīan corpus. Like the creationist works, and *Iḥṣāʾ* in particular, this treatise is imbued with the philosophical tradition of Alexandrian Aristotelianism and possesses a distinct curricular format. It also shares the aim of summarizing Aristotelian philosophy and of elucidating its relation to the revealed religions. This is clear from the author's identification of the highest object of metaphysics with "Allāh," whose name is systematically accompanied by the use of honorific formulas (Exalted be He, etc), as in the creationist works.[146] As A. Bertolacci observed, al-Fārābī stresses the primacy of theology in the metaphysical inquiry and defines the overarching aim (*gharaḍ/skopós*) of *Metaphysics* as the knowledge of the divinity, even though divine matters are expressly discussed only in one section (*qism*) of the work, namely, in Book Lambda.[147]

In this connection, however, al-Fārābī's statement that *Metaphysics* only lightly touches on "the Creator [*al-bāriʾ*], Praised and Exalted be He, the intellect, and the soul," in spite of what "many people" (*kathīr min al-nās*) believe, should not in my view be construed as an indication that he regarded these notions—including the study of God *qua* Creator—as being foreign to Aristotelian metaphysics.[148] It rather indicates that according to al-Fārābī, Aristotle discussed these issues in depth in some of his other metaphysical works, i.e., *Theology of Aristotle*, which were therefore meant to complement *Metaphysics*. This interpretation is strongly supported by the analysis of the creationist treatises that was given previously, which showed that al-Fārābī divided Aristotelian metaphysics into an 'ascending' part corresponding to Book Lambda, and a 'descending' part focusing on procession and God's relation to the created existents and corresponding to the *Neoplatonica arabica*. In this respect, one should keep in mind that *Aghrāḍ* is a summary of *Metaphysics* alone, and not a summary of the

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[146] Al-Fārābī (1999c, 35,11–12).

[147] Bertolacci (2006, 65 ff.).

[148] Al-Fārābī (1999c, 34,8–9). This again is the view of those scholars who divide the Fārābīan corpus into 'Aristotelian' and 'Neoplatonic' works.

entire Aristotelian discipline of metaphysics as al-Fārābī may have conceived it.

Some hints supporting this view can be found in the treatise itself, although they are not decisive. In his description of the subject matter of metaphysics, al-Fārābī states that one of the objects of study is "the principle common to all existing beings [*al-mabdaʾ l-mushtarak li-jamīʿ al-mawjūdāt*], namely, the thing that should be called God." Now, al-Fārābī frequently uses the term *mabdaʾ* in his other works to refer to an efficient principle of existence, and it is presumably in this sense that he intends it here as well. This interpretation is strengthened by the statement made shortly thereafter that God is a "principle of the existent *in the absolute sense* [*mabdaʾ li-l-mawjūd al-muṭlaq*]."[149] And in the same treatise al-Fārābī describes Book Lambda as dealing with "the principle of substance and *of all existence*" (*mabdaʾ l-jawhar wa-l-wujūd kullihī*) and with the "establishment of His [God's] special existence" (*ithbāt huwiyyatihī*).[150] The general point implied in these passages seems to be that God is the principle of existence of all entities and the universal and efficient principle of 'what exists' (*al-mawjūd*). He is not only a final cause, but an efficient cause of existence as well.

Since these metaphysical ideas and this conception of God as an efficient principle of existence are absent from the Greek Book Lambda and are either absent or not articulated in any length in its Arabic versions, it would seem that al-Fārābī is construing this text through the lens of other works, such as *Theology of Aristotle*. In this case as well, the best way to construe these statements of *Aghrāḍ* is to assume

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[149] Al-Fārābī (1999c, 35) and McGinnis and Reisman (2007, 79). This statement would seem excessive if al-Fārābī were limiting God's role to that of a final cause.

[150] The meaning and translation of the Arabic term *huwiyyah* have long been debated by scholars (see Goichon *EI*²). This term appears frequently in the Usṭāth translation of *Metaphysics* and in the *Neoplatonica arabica*, where it is sometimes applied expressly to God (see Adamson 2002a, 124 ff.). In many cases it seems to refer to a kind of 'unity of existence,' which the First possesses absolutely, and which all the other beings possess in a derived sense and as a result of the power of the First; see for instance *Maḥḍ al-khayr* (Badawī 1977a, Proposition 17, 19). McGinnis' and Reisman's (2007, 81) translation of *ithbāt huwiyyatihī* as "It establishes its identity" does not, in my view, capture the true sense of this statement, nor does it emphasize the important connection with the ontology articulated in the *Neoplatonica arabica*. Because of the many parallels between this corpus and al-Fārābī's creationist treatises, there can be little doubt that, as in *Jamʿ* and *Iḥṣāʾ*, he is in this case as well relying on some of these texts, both in his use of the term *huwiyyah* and in his defining God as a principle of existence for the lower beings. Al-Fārābī's use of this word strengthens the hypothesis that he had access to a recension assembled in the Kindī-circle, which combined texts from the *Neoplatonica arabica* and the Usṭāth translation.

al-Fārābī's access to a 'metaphysics file' similar to the one compiled in the Kindī-circle. This file juxtaposed Book Lambda with other texts such as *Theology of Aristotle* with a harmonizing intention. This file presumably informed al-Fārābī's particular understanding of Aristotelian metaphysics, even though he also departed from al-Kindī on other key points, notably on the place of theology in metaphysics. At any rate, it would seem that *Aghrāḍ* is not a straightforward and faithful exposition of Aristotelian metaphysics. It shares many key features with the creationist treatises, even though it neglects the distinctive language of creation that is found in these works.

There is another point of interest for our purposes. In his extremely condensed summary of Book Lambda, al-Fārābī posits several immaterial beings after the First (*al-mawjūdāt al-mufāriqah allatī baʿdahū*), whose existence is said to constitute part of the subject matter of this book.[151] This statement is comparable to the fleeting reference to a multiplicity of immaterial beings in *Iḥṣāʾ*. On this point both *Iḥṣāʾ* and *Aghrāḍ* seem to mark a certain departure from *Jamʿ* and *Jawābāt*, even though all of these works continue to describe God as the only efficient cause and demiurge of the universe. However, if *Iḥṣāʾ* and *Aghrāḍ* both belong to a slightly later stage of al-Fārābī's creationist phase, as I am inclined to think, then this raises the question of how al-Fārābī would have reconciled the doctrine of the contingency and temporal finitude of the corporeal world with the doctrine of a plurality of immaterial beings distinct from God. Would these immaterial beings be eternal and the corporeal world temporally finite? Or would all levels of existence—both the corporeal and immaterial—be originated and destroyed by God? It is interesting to note that a similar ambiguity underlies the account of creation in *Theology of Aristotle*.[152]

I cannot provide a compelling explanation of these questions at the present time. However, this ambiguity might be alleviated by means of the developmentalist approach adopted in this book. Accordingly, *Iḥṣāʾ* and *Aghrāḍ* would embody a later stage of al-Fārābī's creationist phase, in that they explicitly posit a level of immaterial beings between God and the world. Al-Fārābī would have introduced this theory in his metaphysical system, even though he continued to uphold the doctrines of the temporal finitude of the world and of

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[151] Al-Fārābī (1999c, 38,2–4).
[152] Adamson (2002a, 154, and note 59).

the absolute creative power of God. It is even possible that al-Fārābī believed that both the intelligible and corporeal existents were created and that neither is actually eternal.[153] Putting this issue aside, the creationist position identified in *Jamʿ* seems to underlie the metaphysical accounts of *Iḥṣāʾ* and *Aghrāḍ*.

2.3. *A Common Cosmogonical Paradigm*

In the previous paragraphs, I argued that *Jamʿ*, *Jawābāt*, *Radd*, *Iḥṣāʾ*, and possibly *Aghrāḍ* were most likely written from a similar creationist viewpoint indebted to *Neoplatonica arabica* and the Philoponian tradition. This creationist paradigm is defined chiefly by: a) the absolute creation of the world *ex nihilo* and *with* time; b) the idea that God created the world as a result of His will; c) the finitude of the temporal existence of the world; d) the idea that time is the measure of the heavenly motion and comes into existence together with the heavens; and e) the assumption that God can be described using both philosophical terminology (First Agent, First Cause, etc.) and religious terminology (Allāh, the Creator, the Originator, etc.), and thus that religious truths can be formulated in philosophical language. Interestingly, this creationist picture can also be found in an almost identical form in the works of some Jewish authors, such as Isaac Israeli and Saadia Gaon, which shows that it was widespread and highly influential in the various philosophical circles that flourished during the classical period of Islamic civilization. In addition, however, it may have penetrated the circle of the Christian Peripatetic scholars in Baghdad to which al-Fārābī gravitated. While it is customary in studies on Arabic thought to oppose the Christian Peripatetics to al-Kindī and his legacy, little is known about entire aspects of their philosophy, including their cosmology, and so this judgment should not be accepted *a priori*

[153] The idea that the immaterial beings were created and are also subject to destruction is difficult for us to imagine, given that they lie beyond time and, hence, that their activity transcends temporal generation and corruption. But if the developmentalist hypothesis defended here is correct, one must acknowledge the possibility that al-Fārābī did adhere at one point in his life to the theory of the absolute creation and destruction of both the material and intelligible levels in the sense that neither is actually eternal. Since the underlying assumption is that al-Fārābī very gradually evolved from a creationist model to one of eternal causation at the very end of his life, a transitional period containing certain tensions or even contradictions from our modern viewpoint cannot be excluded.

and without certain reservations. For this reason, and because these Christian thinkers represent a crucial link in the reconstruction of al-Fārābī's philosophical development, I will provide in what follows additional insight into al-Kindī's views on creation, briefly mention the Jewish thinkers, and subsequently provide a tentative reconstruction of Mattā ibn Yūnus' cosmology on the basis of the surviving fragments of his commentary on *Physics*. This will in turn lead to a clearer appreciation of the many links between their works and al-Fārābī's creationist treatises.

2.3.1. *Al-Kindī on Body, Motion, and Time*

Al-Kindī's creationist view has been discussed quite extensively in the modern literature, and so I will limit myself here to certain features that have in my opinion not been sufficiently stressed.[154] In his various works on cosmology, al-Kindī defines God's act of creation by relying on terms derived from the Qur'ān and the Arabic theological tradition, as well as from the philosophical culture prevalent during his time. Hence, God is called the "Originator" and "Creator" (*al-mubdiʿ*, *al-bāriʾ*, *al-muḥdith*),[155] as well as "the First Agent" (*al-fāʿil al-awwal*), the "First Cause" (*al-ʿillah al-ūlā*), and "the end of each cause" (*ghāyah kull ʿillah*).[156]

Al-Kindī holds that God created the world from non-being (*ʿan lays*) and as a result of His will.[157] Although the expression "creation in time" has often been used—confusedly—to describe al-Kindī's position, he regarded creation itself as something atemporal, which means both that it did not unfold over a period of time and that it did not take place at a particular point in time—time already being in existence. On the contrary, time is defined as the measure of bodily motion, and its existence is therefore concomitant with body and motion, and more specifically with the movement of the first body, i.e., the heavens. Body, motion, and time, al-Kindī repeatedly stresses, were brought into existence together and cannot exist independently one from the other. They possess only a finite existence and are not eternal. Hence, although

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[154] See notably Atiyeh (1966), Jolivet (1993) and Adamson (2002b and 2007a).
[155] Al-Kindī (1998, 145,12; 147,4; 169,13).
[156] Al-Kindī (1998, 145,18–19; 169,7; 171,5).
[157] Al-Kindī (1998, 145,12). I am following Adamson (2003, 59) for the translation of *ʿan lays* as "from non-being."

creation itself is atemporal, the world's existence is clearly finite: it has a beginning and an end and will eventually be destroyed by God.[158]

This account is relatively straightforward, but al-Kindī adds other features that complicate it somewhat. As we saw in the previous section, he believes that the heavens are made of a special substance that is in nature incorruptible and unchanging, and that this heavenly substance will remain unchanged until God decides to destroy the world.[159] This celestial substance is therefore potentially everlasting, even though it will effectively cease to exist at a certain point due to divine decree. Interestingly, al-Kindī seems to extend this view to motion and time as well. Since the heavenly body as a whole is made of this special substance, its motion and in turn the time which measures its motion, are theoretically and potentially everlasting. Hence, the phenomenon of celestial motion, for instance, is not only regular, unchanging, and continuous, but also potentially infinite, although it will cease when God decides to destroy the world.

The foregoing helps us to understand in what sense al-Kindī in one of his treatises repeatedly uses the terms *dāʾim* and *abadan* to qualify the celestial bodies. This usage might at first glance appear surprising, since these terms often mean "eternal" or "perpetual" in the Arabic philosophical and theological contexts. As al-Kindī writes, the heavenly body is "a living being that is always [or eternally] in actuality" (*ḥayy bi-l-fiʿl abadan*); it is endowed with "perpetual life" (*ḥayāt dāʾimah*); its motion is "perpetual" (*dāʾiman*).[160] In this case, however, and in light of what was said above, the terms *dāʾim* and *abadan* should not be construed as meaning "(actually) eternal," but rather as meaning "continuous," or better "potentially unceasing or perpetual." Al-Kindī thus manages to combine an adapted version of aether and the notion of the continuous and potentially perpetual motion of the heavens with the ideas of the temporal finitude of the world and of its absolute creation. While seemingly contradictory, al-Kindī's position hinges on a subtle interpretation of the distinction between "actual perpetuity" and "potential perpetuity" or, as he writes, between "potentially infinite" (*lā nihāyah bi-l-quwwah* or *min jihat al-imkān*) and "actually infinite" (*lā nihāyah bi-l-fiʿl*).[161] Since, according to al-Kindī, an actual infinite is

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[158] See for instance al-Kindī (1998, 143,13–14; 155,10–12).
[159] Al-Kindī (1998, 179,19–23; 181,6–7; 189,6–9).
[160] Al-Kindī (1998, 187,14–15,20–22; 189,1).
[161] Al-Kindī (1998, 141,11–15).

impossible, the world, including the heavens, its motion, and the time that measures it, are necessarily finite, and this even though they are potentially perpetual. The subtlety—and to some extent ambiguity—of al-Kindī's view is conveyed in his statement that "the body, motion, and time [of the universe] are not eternal [*azaliyyah*], even though they are an eternal essence at the beginning of existence [*bal dhāt azaliyyah fī bad' al-anniyyah*]."[162]

Consequently, al-Kindī's view shares several key parallels with the doctrine articulated in al-Fārābī's creationist treatises. The ideas that God created the world through His will; that it is an absolute creation from nothing, or from non-being; that creation itself is atemporal; that time is concomitant with body and motion and comes to be with the creation of the heavens; and that the world and the heavens possess a beginning and an end and will be destroyed, even though the heavens are made of a special incorruptible substance, are all features that can be found in al-Kindī's cosmological treatises and in *Jam'* and *Jawābāt*. These treatises are also characterized by a dual description of God that relies on both the philosophical terminology of efficient causation and the orthodox Islamic names of God as Creator. Many of these features can be traced to the Philoponian tradition in Islam, which shows that the Arabic translations of this thinker's writings had a lasting and diffused impact on cosmological theories in classical Baghdad, the metropolis in which both al-Kindī and al-Fārābī were active.[163] Having elucidated this connection, one may turn to the question of how other major thinkers of this period fit in this cosmological tradition.

2.3.2. *Isaac Israeli and Saadia Gaon on Creation*

The creationist views of two of the most important Jewish thinkers who flourished during the 'Abbāsid period will be briefly examined, in order to show their overlap with those of al-Kindī and al-Fārābī in his early works. Saadia Gaon (d. 942 CE) provides a detailed account of creation and surveys the various arguments proving the existence of the Creator in his work entitled *The Book of Beliefs and Opinions* and in his commentary on *Book of Creation*. He defends the theses of the *ex nihilo*

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[162] Al-Kindī (1998, 155,11–12).

[163] For the connection between Philoponus and al-Kindī on creation, see Davidson (1969), Adamson (2003), and Janos (2009a, 10–11). One key difference is al-Kindī's view that the heavens are made of a special incorruptible element, as Philoponus rejected this idea and famously criticized Aristotle's theory of aether.

creation of the world by God (*ikhtaraʿa lā min shayʾ*), of divine volition, and of the temporal finitude of the universe. The world and the heavens are said to have a beginning and an end, to have been created with time and all at once (*dafʿatan wāḥidatan*), and to be finite (*mutanāhiyyatān*).[164]

The creationist position of Isaac Israeli (d. ca. 955 CE) is more ambiguous and has been the object of some debate in the secondary literature, but here I will merely highlight a few salient features of his doctrine without engaging in its deeper implications.[165] According to the surviving writings of Israeli, God is described as "the Creator" (*al-bāriʾ*), as well as "the First," "the Agent" and "the Cause of causes." God willed the *ex nihilo* and absolute creation of the world, or alternatively, of intellect through which He created the other entities, and He subsequently appointed the celestial sphere as governor of the processes of generation and corruption in the sublunary world.[166] This theory of creation is at any rate presumably not an eternalist one, implying that the world has a finite existence.[167] Also noteworthy is that Israeli's definitions of 'innovation' (*al-ibdāʿ*) as "making existent existences from the non-existent" (*taʾyīs al-aysāt min lays*) and of time as "an extension separated by the movement of the sphere" echo al-Kindīʾ views on the one hand and al-Fārābī's *Jamʿ* on the other.[168]

This brief overview shows that the creationist doctrine adopted by Isaac Israeli and Saadia Gaon correspond on essential points to the

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[164] Saadia Gaon (1891, 1,3–5; 11,16–17; 34,8–9 of the Arabic text and 1976, 41 ff.).

[165] Wolfson (1959) provides an overview of the different interpretations concerning Israeli's theories of creation and emanation. Much of the disagreement centered on the artificial opposition of creation *ex nihilo* and emanation, which Wolfson reconciles in his article. But see the reply by Altmann (1979), and for a more recent treatment, Levin and Walker (2008).

[166] Altmann and Stern (1958, Fragment V, 91; sec. 8, 126; sec. 6, 46,22–24).

[167] Wolfson (1959, 12): "What we have here in Israeli is a theory of a volitional and presumably also non-eternal process of emanation in which the first emanated being is described as having been created *ex nihilo*." Levin and Walker (2008) agree with Wolfson on Israeli's rejection of eternity.

[168] Altmann and Stern (1958, Definitions 42 and 49, pages 66 and 77 respectively). Scholars have emphasized the many parallels between al-Kindī and Isaac Israeli, including their views on creation; see Altmann and Stern (151 ff.) and Levin and Walker (2008): "Although explication of the nature of God is absent in the surviving fragments of Israeli's philosophical corpus, it is apparent that Israeli, like the Muslim philosopher al-Kindi before him, combined the Neoplatonist notion of God as the source of emanation of all things, with the idea common to the monotheistic religions, of a willful Creator who created the world in time. In blending these two conceptions, these philosophers rejected the Aristotelian conception of the eternity of the world, as well as the idea of eternal emanation of some of the Greek Neoplatonists."

one that can be found in al-Kindī's works and in al-Fārābī's early treatises, especially *Jamʿ*. The main features of this doctrine, as well as the Neoplatonic and Philoponian sources underlying it, overlap to a remarkable degree, implying that this syncretistic creationist paradigm was shared by both Muslim and Jewish authors active in Baghdad during the ninth and tenth centuries. This fact lends further weight to the hypothesis that al-Fārābī adhered to it during a period of his life.

2.3.3. *Mattā ibn Yūnusʾ Cosmology and his Commentary on Physics*

One element of the puzzle that remains obscure is the connection between al-Fārābī and his teacher Mattā ibn Yūnus with respect to their views on cosmology. Since virtually all of the latter's many writings have perished, it is particularly difficult to assess in what sense he may have influenced al-Fārābī during his stay in Baghdad and whether he may in his capacity as Christian thinker have contributed to shaping the latter's creationist position. Fortunately, however, various excerpts from Mattā ibn Yūnusʾ commentary on Aristotle's *Physics* have survived, which enable us to shed some light on this important question. In what follows, I analyze certain key passages from this commentary, which has rarely been studied, and which stands as a unique piece of evidence to better understand the early stage of al-Fārābī's philosophical development and his relation to his Christian teachers.

The commentatorial notes by Mattā ibn Yūnus that have come down to us focus on Books 2–3 of *Physics* and were added to the translation of this work executed by Isḥāq ibn Ḥunayn sometime in the late ninth or early tenth century CE.[169] Although they are not directly concerned with cosmological issues, the many remarks Mattā ibn Yūnus makes with regard to Aristotle's physical principles, such as form, matter, motion, etc., enable us to identify some key features of his cosmology. The global cosmological picture that can be reconstructed from these excerpts appears at first glance thoroughly Aristotelian, but I will focus here only on those aspects which depart from this norm and which are of direct relevance to the issue at stake.

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[169] See Arisṭūṭālīs (1964, vol. 1, 110–211). This edition also contains the notes of Yaḥyā ibn ʿAdī, Ibn al-Samḥ, and Abū l-Faraj ibn al-Ṭayyib. Part of Mattā ibn Yūnusʾ commentary has been translated into English, first by Lettinck (1994) and subsequently by McGinnis and Reisman (2007, 122–128). See also Hasnawi (1996) for a study of the excerpts conveyed by Abū ʿAmr al-Ṭabarī, one of Mattā ibn Yūnusʾ disciples.

First, it is striking, albeit not surprising, that Mattā ibn Yūnus follows the late antique philosophical tradition in defining Aristotle's divinity both as a final and efficient cause, with the implication that God is not only a mover or first cause of motion, but, in addition, responsible for the origination and existence of the world. This view appears clearly in many passages of the commentary, where Mattā ibn Yūnus describes God as "the First Principle" (*al-mabdaʾ l-awwal*) with respect to the end (*ghāyah*), as "the Unmoved Agent" (*al-fāʿil ghayr al-mutaḥarrik*), as "the First Agent" (*al-fāʿil al-awwal*), and as "the Creator" (*al-bāriʾ* and *al-khallāq*).[170] These last two terms clearly indicate that Mattā ibn Yūnus considered the supreme deity to be not only a final cause, but also an efficient cause and a demiurge, Who could be defined by means of the Arabic theological vocabulary that was shared by both Christians and Muslims during this time.[171] What we witness in these excerpts, then, is the survival of the late antique commentatorial tradition on Aristotle and its accommodation within a monotheistic model. This seems to have been a pattern in the early Arabic context, judging from the variety of works in which it can be observed, which range from al-Kindī's treatises and the commentaries of the Baghdad

[170] Arisṭūṭālīs (1964, vol. 1, 138, 140–141, 147, and 151).

[171] The use of these terms would be utterly unaccountable if Mattā ibn Yūnus believed, as Brown (1972, 44–45) seems to claim, that God is only a final cause of motion, and not a real efficient cause of existence. Brown argues that the concept of "efficient nature" (*al-ṭabīʿah al-faʿʿālah*) this Christian thinker adopts deprived God of true efficient agency, and that this is what triggered Ibn Sīnā's later criticism. In fact, Mattā ibn Yūnus clearly subordinates this "efficient nature" to the agency of God, stating that it is spread in the world "on account of the creator" (*min qibal al-khallāq*, 147). Mattā ibn Yūnus' digression on efficient nature seems to be merely an extension, as Brown also notes, of Alexander's views, as they appear for instance in *Mabādiʾ* (Alexander 2001, 113). Moreover, the disagreement referred to by Brown between Mattā ibn Yūnus and Ibn Sīnā as expressed in the latter's commentary on Book Lambda (Badawī (ed.) 1947, 26) seems to focus on how the modality of "necessity" (*ḍarūrah*) can be applied to celestial motion, i.e., whether the circular motion of the heavens is necessary due to another being or due to its very nature. But this issue does not in any way entail Mattā ibn Yūnusʾ denial that God is an efficient cause for the world's existence. In this sense, Brown's article seems to be conflating several different issues. One should remember that Ibn Sīnā based his entire metaphysics on subtle modal distinctions, such as 'possible' and 'necessary,' which he developed or which were not used in such an elaborate form by his predecessors. In any case, we know very little about Ibn Sīnā's controversy with the Baghdad school, and with Mattā ibn Yūnus in particular, so that it seems unreasonable to draw far-reaching conclusions concerning the latter's philosophy from the Avicennian sources.

Christian scholars to the *Neoplatonica arabica* as well as to al-Fārābī's *Jamʿ* and *Jawābāt*. In contrast to this trend, however, it should be noted that the Arabic names of God as creator are entirely absent from al-Fārābī's mature metaphysical treatises, which refer to the highest divinity by relying solely on the philosophical vocabulary of causation (First Cause, First Principle, etc.).

It is difficult to draw the outlines of Mattā ibn Yūnus' cosmology more precisely, due to the lack of relevant information in his commentary. In particular, one hesitates to reach any conclusion concerning his position on the eternity or finitude of the world and on the mode in which God created it. Some of his statements seem to point to the infinity of time and motion, which could imply that Mattā ibn Yūnus believed in the eternity of the corporeal world, and thus in the eternal creation of the world by God. For instance, Mattā ibn Yūnus mentions that the motions of the heavenly bodies are perpetual (*dāʾiman*), as are certain sublunary phenomena, such as the seasons, which occur on a cyclical basis.[172] In addition, his discussion of motion seems to rest on the assumption that this principle is infinitely continuous, even though a first mover must be posited to explain it.[173] It could very well be, then, that Mattā ibn Yūnus endorsed Aristotle's thesis of the world's eternality, which he somehow reconciled with the notion of a Creator God and thus with the proposition of the world's eternal creation or causation.

But this conclusion is not devoid of ambiguity and is not supported by other statements that appear in the commentary. Indeed, there are some reasons to think that Mattā ibn Yūnus may have upheld a creationist theory similar to the one adopted by al-Fārābī and al-Kindī. To begin with, there is the strong likelihood that the term *dāʾiman* used by Mattā ibn Yūnus to refer to the motions of the heavenly bodies should be understood as meaning merely "continuous" or "potentially perpetual," rather than "eternal," with the same meaning as the one encountered in al-Kindī's treatises. This is suggested by the context in which this statement appears, which consists of a discussion of the purposiveness of nature and of the source of motion in things. Having just stressed that celestial motion does not occur by chance, but for a purpose, since it is regular and perpetual, Mattā ibn Yūnus then inquires

[172] Arisṭūṭālīs (1964, vol. 1, 141, 148).
[173] Arisṭūṭālīs (1964, vol. 1, 167–169).

whether its cause is inherent in the heavens or lies outside of it. And he writes:

> Now, the world as a whole is finite [*wa-l-ʿālam kulluhū mutanāhin*], but infinity cannot exist in what is finite. Hence, the nature of this infinite power [*ṭabīʿat al-quwwah ghayr al-mutanāhiyyah*] must exist separately from these [finite] natures [*ṭabāʾiʿ*].[174]

This passage immediately brings to mind al-Kindī's own proofs for the world's creation and his views on finitude and infinity as discussed in the previous section. Although it is not spelled out in detail, the implication of this argument could be the same as the one reached by al-Kindī: the world is finite and therefore possesses a finite power, with the implication that time and motion continue to exist as long as an external infinite power, i.e., God's power, is conferred upon it. The perpetual rotation of the heavens is not due to its inherent nature, but rather dependent on the will and power of the Creator. This passage should be compared to another statement made by Mattā ibn Yūnus to the effect that the "revolution of the heaven is continuous [or perpetual] [*dāʾiman*] due to [ʿ*an*] the agent [*al-fāʿil*, i.e., God]."[175] In this case as well, the intended meaning could be that the celestial motion is only potentially "continuous" and "perpetual" and exists during the period of time allotted by God. Hence, we seem to find in Mattā ibn Yūnus' work the double thesis of the creation of the world—clearly expressed by his description of God as *al-khallāq* and *al-bāriʾ*—and of the idea that the body of the world, as well as motion and time, while finite, derive potential perpetuity from the divine power.[176] This cluster of doctrines, which is a marking trait of al-Kindī's works and which can also be traced to an excerpt of *Philoponus arabus*, could very well have been adopted by Mattā ibn Yūnus in his *Physics* commentary, in spite of the fragmentary and ambiguous evidence.[177]

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[174] Arisṭūṭālīs (1964, vol. 1, 148).

[175] Arisṭūṭālīs (1964, vol. 1, 141).

[176] It is possibly partly in reaction to these early interpretations of potential infinity and to their accommodation within a creationist model that Ibn Sīnā decided to provide a more refined conceptual distinction between potential and actual infinity; on this point, see M. Rashed (2005, 298–302). Indeed, Ibn Sīnā redefines the meaning of these concepts in his philosophy and seems to have adhered to a "weak version" of the world's actual eternity, perhaps in an attempt to distance himself from these early thinkers and their ambiguous interpretation of potential infinity.

[177] See Pines (1972). This short treatise focuses on Philoponus' argument from the finitude of bodies and their power. The gist of this argument as reported in the summary is as follows: "If the world is a finite body … and if the forces of every finite body

If the foregoing interpretation is correct, Mattā ibn Yūnus could be connected with al-Kindī and the Arabic Philoponian tradition on the one hand, and with the early Baghdad phase of al-Fārābī on the other, thereby uncovering an intellectual lineage that has not yet been fully acknowledged in previous studies on early Arabic thought. As the analysis showed, a cluster of somewhat idiosyncratic cosmological features can be found in an identical form in al-Kindī's cosmological works, in Isaac Israeli's and Saadia Gaon's writings, and in al-Fārābī's *Jamʿ*, *Jawābāt*, *Radd*, and *Iḥṣāʾ*. These features may also underlie Mattā ibn Yūnus' commentary, thus making him a link between al-Fārābī and these earlier philosophers.[178] As P. Lettinck observed, Mattā ibn Yūnus relied extensively on Philoponus' commentary on *Physics* to compose his own commentary on this work, and it is likely, in addition, that he knew excerpts of Philoponus' *Against Aristotle*, which circulated widely in the Arabic context.[179] The Philoponian trend identified in the case of

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are finite … then the world must have been created in time and have come into existence after not having existed" (Pines 1972, 323–324). This simplified proof relies on some of Aristotle's comments in Book 8 of *Physics*, which it employs against the eternity thesis of the Stagirite by establishing a direct equation between finitude and creation. What is particularly noteworthy for our purposes is the attitude that the author of this summary displays vis-à-vis the notion of an infinite power. According to him, the fact that the world receives the infinite, divine power does not in any way imply its eternity, for the crucial distinction according to him rests on having an infinite power inherently or by nature versus being the recipient of an external power, infinite or not. In the latter case, contingency and creation must be posited regardless of the duration during which this power acts; see Pines (1972, 324). Interestingly, this connects with al-Kindī's views on creation, finitude, and the indeterminate temporal duration of the world. It suggests that although Mattā ibn Yūnus posits an infinite power in his explanation of the world and motion, this does not necessarily imply a corollary belief in the eternity of the world. Indeed, he could very well, like the author of this summary and al-Kindī, have reconciled the doctrine of infinite power with the doctrines of creation *ex nihilo* and the temporal finitude of the world. Hence, the fact that the notions of finitude-infinity are often subsumed within a larger cosmogonical paradigm leads to various subtle transformations in their meaning depending on a thinker's overarching aim.

[178] On the other hand, al-Kindī, al-Fārābī, and probably Mattā ibn Yūnus do not endorse Philoponus' critique of the Aristotelian theory of aether and his view that the heavens are composed of a perishable substance, since they all uphold the incorruptibility and immutability of celestial matter. Al-Kindī is to my knowledge the first thinker in Islam to combine a variant of the aether theory with the notion of the world's creation and temporal finitude. In the case of Mattā ibn Yūnus, this view is reported by Abū ʿAmr (Arisṭūṭālīs 1964, vol. 1, 166, and Hasnawi 1996), according to whom Mattā ibn Yūnus included the study of the "fifth body" (*al-jirm al-khāmis*) in the physical investigation. This is one of the many technical terms used by Arabic thinkers to refer to aether or a variant of this theory. There is unfortunately no way of learning more about how Mattā ibn Yūnus conceptualized this celestial substance.

[179] Lettinck (1994, 129, 197, 201, 208, and passim).

al-Kindī and al-Fārābī seems to play an important role in this case as well, especially with regard to the proposition of the world's finitude, which could very well form part of a larger cosmogonical picture in the philosophy of Mattā ibn Yūnus. This interpretation nevertheless remains hypothetical at this stage, due to the fragmentary nature of his work.[180]

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[180] In this view, there would be essential parallels between the cosmological doctrines of al-Kindī and at least some of the Baghdad Peripatetics, such as Mattā ibn Yūnus and al-Fārābī in some of his works. While the secondary literature has rightly stressed the different philosophical outlook of these thinkers, few in-depth studies have been carried out on the cosmological and metaphysical doctrines of the Baghdad Peripatetic thinkers (except al-Fārābī), and so it is unclear to what extent their cosmological system relates to that of al-Kindī. The present analysis suggests that the connection might be stronger than previously thought. What is more, the creationist doctrines discussed above should also be compared anew to those of al-Fārābī's later works and Ibn Sīnā's philosophical summae. Here again one would find many points of agreement. All of these thinkers agree that creation itself is atemporal, since time is concomitant with body and motion and is measured by the heavenly revolution. The main difference would lie in the fact that al-Kindī, Saadia Gaon, possibly Mattā ibn Yūnus in his commentary, and al-Fārābī in *Jamʿ*, uphold the temporal finitude of the world and its future destruction by God, whereas the mature al-Fārābī and Ibn Sīnā do not. These thinkers would also agree that during its existence (finite for the former, infinite for the latter), certain phenomena such as heavenly motion and sublunary generation and corruption are regular, continuous, and potentially perpetual, meanings conveyed by the term *dāʾim*. Although this term is ubiquitous in their works, it possesses different semantic nuances depending on how they construe the notion of potential infinity. Finally, they all uphold the similar view of a celestial substance that is unchangeable and incorruptible and therefore also potentially eternal. As far as I can see, then, three key criteria of differentiation between these views can be identified. First, the presence or absence of a clearly articulated thesis of the world's beginning and destruction and of its temporal finitude. This thesis is articulated explicitly by al-Kindī in his works and by al-Fārābī in *Jamʿ* and *Jawābāt*, and it may very well underlie Mattā ibn Yūnusʾ views in his *Physics* commentary, although he does not make any explicit statements to this effect. On the other hand, al-Fārābī in his later treatises and Ibn Sīnā in his main philosophical works are silent about a beginning and an end to the world's existence. Moreover, they interpret the Last Judgment and the resurrection of the bodies allegorically. Second, these thinkers' interpretation of potential and actual infinity. For instance, the proposition of the potential infinity of motion and time is interpreted by al-Kindī as meaning that the world is *not* eternal and as the opposite to actual infinity. For al-Kindī, potential perpetuity or infinity does not imply eternity, but finitude. In contrast, for Ibn Sīnā, potential infinity implies eternity, and with regard to the world, Ibn Sīnā is even willing to apply to it a "weak version" of actual infinity; see M. Rashed (2005, 298–302). Third, the better known opposition between divine will and necessary causality, discussed extensively by al-Ghazālī in his *Tahāfut al-falāsifah*, for instance. I am perfectly aware that in presenting the following interpretation I am departing quite markedly from most accounts on creation in medieval Arabic thought and from the common tendency to oppose both al-Kindī and Ibn Sīnā to the Christian Peripatetics. While it is true that there are crucial differences between these thinkers, it appears that some of these differences have been unduly exaggerated, while others have barely been noted. As the previous analysis shows, their views on creation, time, and infinity are extremely intricate and require a careful, case by case examination.

2.3.4. *Ibn Suwār on Creation*

Abū l-Khayr al-Ḥasan Ibn Suwār, who flourished during the late tenth century CE and was a disciple of Yaḥyā ibn ʿAdī in Baghdad, provides slightly later, but equally valuable testimony for our discussion on creation. By virtue of his intellectual lineage, he is connected to al-Fārābī, with whom Yaḥyā had studied. It is remarkable in this respect that Ibn Suwār wrote a short treatise on the subject of creation that contains virtually all the essential points discussed in the previous analysis.[181] This treatise was written in order to criticize the *kalām* proof from bodies and accidents aiming to show the world's contingency. Ibn Suwār begins his treatise by identifying the shortcomings of the *mutakallimūn* and by refuting their handling of this creationist argument, and he subsequently explains why John Philoponus' argument for creation from the finite power of the world should be preferred.

What is important for our purposes is the insight Ibn Suwār provides in the course of his exposition into his own view on creation. His position, which is clearly inscribed in the creationist paradigm outlined previously, consists of the following points: a) God can be described both as a Creator and a cause; b) God created the world all at once and not over a period of time; c) God created the world through His will (Ibn Suwār cites scripture to this effect: "He [God] said [to a thing "be"], and it was [*qāla fa-kāna*]")[182]; d) time is the measure of heavenly motion, and its existence follows that of the orbs; e) eternity belongs to God only, while the world may be said to be temporally perpetual. It should be noted that Ibn Suwār, like al-Kindī and al-Fārābī in *Jamʿ*, ascribes this creationist position to Aristotle.

These doctrinal points, as well as the terminology used throughout the treatise, are identical to the ones that can be found in the accounts of al-Kindī and al-Fārābī in his creationist works. Unlike these authors, however, Ibn Suwār does not explicitly mention the temporal finitude of the world and its eventual destruction by God. This omission, when combined with his view on the atemporal causation of the world, could lead to the impression that Ibn Suwār believed in eternal creation.[183]

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[181] Badawī (1977a, 243–247). The Arabic title of this treatise is: *Maqālah Abī l-Khayr al-Ḥasan ibn Suwār al-Baghdādī fī anna dalīl Yaḥyā l-Naḥwī ʿalā ḥadath al-ʿālam awlā bi-l-qubūl min dalīl al-mutakallimīn aṣlan*.

[182] Badawī (1977a, 247).

[183] This is the view I myself reached in a previous article; see Janos (2009a, 6). Additional research into the creationist theories of early Arabic authors has led me to reconsider this position.

In spite of this, there is evidence that Ibn Suwār's view on creation is in fact identical to that of al-Kindī and al-Fārābī on this point as well. To begin with, Ibn Suwār himself states that the world is "not eternal," by which he clearly means to say that its temporal existence is finite, and he also endorses one of Philoponus' proofs for the contingency of the world.[184]

Moreover, he refers to the authority of Proclus (i.e., of *Proclus arabus*) to argue that the term *azalī* can be applied to both God and the world, but has a different meaning in each case: in the case of God, *azalī* means "true everlastingness" (*dahr*), while in the case of the world it is merely synonymous with time (*zamān*). And Ibn Suwār pointedly adds that time is what befits the contingent (*al-mutakawwin*).[185] These statements should surely be understood in the same way as al-Kindī's identical statement that the world is *dāʾim* and *azalī*, even though God alone is truly eternal. Hence, it would seem that, like al-Kindī, Ibn Suwār regarded the existence of the world as being temporally continuous and (potentially) perpetual, but not as something actually eternal. This in turn means that while God's creation is atemporal, the world itself has a beginning and an end.

When combined with the focus on Philoponus and the creationist reading of Aristotle, all of these points make Ibn Suwār's treatise a mirror image of al-Kindī's and al-Fārābī's accounts on creation. This indicates that the creationist doctrine identified previously continued through al-Fārābī to some of his disciples, and even to disciples of his disciples. This historical continuity and the endurance of this cosmogonical paradigm in Baghdadi philosophical circles with which al-Fārābī was associated lends even more weight to the hypothesis that he adopted this particular creationist position during a period of his life.[186]

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[184] Badawī (1977a, 246): *lam yalzam an yakūna l-jism qadīman*. Ibn Suwār also endorses the Arabic adaptation of Philoponus' proof from the limited power of bodies, which ends with the conclusion: "hence, the world is not eternal [*laysa bi-sarmadiyyin*]."

[185] Badawī (1977a, 247).

[186] Again, I must stress that my interpretation of the view of creation exposed, e.g., in Ibn Suwār's treatise, departs from that of many other scholars, who infer from the statement of the atemporality of creation and from the qualification of God as a cause (*sabab*) that what we are dealing with here is essentially an account of eternal creation or causation similar to the one articulated later by al-Fārābī in his mature treatises as well as by Ibn Sīnā. I believe, for my part, that this conclusion should be resisted. For these creationist thinkers seem to be using the term *sabab* in a looser way, and

2.4. *Conclusion*

The previous analysis has shown that several works by al-Fārābī, namely, *Jamʿ*, *Jawābāt*, *Radd*, *Iḥṣāʾ*, and possibly *Aghrāḍ*, share idiosyncratic terminological and conceptual features and a common creationist doctrine, and that these features and creationist doctrine are inscribed in a 'cosmogonical paradigm' shared by many other Muslim, Christian, and Jewish thinkers who flourished during the ninth and tenth centuries. This cosmogonical or creationist paradigm can be attributed convincingly to al-Kindī, Saadia Gaon, and Ibn Suwār, and possibly also to Isaac Israeli and Mattā ibn Yūnus, even though the evidence is sparse in their case. It seems to have been adopted by Yaḥyā ibn ʿAdī as well, one of al-Fārābī's immediate disciples.[187] This is not to say that these thinkers shared an *identical* view on creation, but rather that their position on this issue agrees on fundamental points, which, when taken together, constitute a distinct and clearly recognizable cosmogonical model. The salient traits of this paradigm are a syncretistic creationist doctrine combining elements from the *Philoponus arabus*, the *Neoplatonica arabica*, and the Biblical and Qurʾānic texts, as well as the conviction that religion and philosophy are not opposed and that fundamental religious tenets can be formulated in philosophical language; hence, the juxtaposition in all of these works of religious and

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without the implication that the world is *necessarily* an eternal effect emitted by God. Indeed, as can be seen clearly in the cases of al-Kindī, of Isaac Israeli, and of al-Fārābī in *Jamʿ*, the idea that God is a cause of the world's existence is juxtaposed with the ideas that God willed the world to exist, that the world is temporally finite, that it has a beginning and an end, and that it originated from nothing or non-being and will return to non-being. Accordingly, these thinkers' emphasis on the instantaneity and atemporality of creation is not meant to express a doctrine of eternal creation—whatever this is supposed to mean—but rather the more simple and relevant point that God's act of creation did not elapse over a period of time and hence cannot be compared to the way in which bodies are generated in time. In this regard all of these thinkers provide the standard example of a sublunary body, such as a plant, which requires time to be generated and grow. In my view, this basic argument is primarily aimed at the literalist reading of the creationist account in the Old Testament and the Qurʾān championed by some traditionalists, according to whom God's creation of the world extended over several days. Clearly, al-Kindī, al-Fārābī, and Ibn Suwār are opposing this view. However, far from being a statement of eternal creation, theirs is a clarification of the way or mode in which God originated the world, which draws on philosophical notions, but ultimately aims to provide a correct exposition of the fundamental religious tenets of creation *ex nihilo* and of the world's temporal contingency. In this case, then, atemporality should not be correlated with eternal creation.

[187] On Ibn ʿAdī and creation and how this thinker fits in the context under discussion, see M. Rashed (2009) and Janos (2009a, 7–8).

philosophical terminology to describe God and His act of creation and the frequent reliance on citations from scripture to illustrate a particular point.[188]

The central place of Aristotle's *Metaphysics*, Book Lambda, and of the *Neoplatonica arabica* in al-Fārābī's approach to metaphysics and in his creationist doctrine suggests that these were in some ways a continuation of al-Kindī's philosophical project.[189] Accordingly, I would hypothesize that during this period of his life, al-Fārābī had access to a variant of what F. Zimmermann called the "metaphysics file," which had been assembled in the Kindī-circle some time before. This file consisted of an arrangement of these Aristotelian and Neoplatonic works into a coherent program of study.[190] This would account for the fact that al-Fārābī discusses Book Lambda of *Metaphysics* and *Theology of Aristotle* side by side in his works and why he probably considered both to be genuine Aristotelian texts. It would also explain his intention to reconcile Greek philosophy with the Islamic revelation, which was a priority of the Kindī-circle.

But this raises the thorny question of how these authors interpreted the doctrine of creation in the *Neoplatonica arabica*. For they employ the common strategy of using *Theology of Aristotle* and germane material from the Arabic Neoplatonic corpus to argue for the contingency and non-eternity of the world. In this connection, it has been widely assumed in the modern literature that *Theology of Aristotle* articulates a theory of eternal creation, but the fact remains that some authors,

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[188] Al-Fārābī either cites the Qurʾān explicitly or refers to it implicitly on numerous occasions in *Jamʿ* (1999e, sec. 59, 137; sec. 67, 145) and *Jawābāt* (1992, 315). It is not surprising that we also find this juxtaposition of the 'creationist paradigm' and heavy reliance on scripture in al-Kindī's treatises and in Saadia Gaon's commentary on the *Book of Creation*. This method of reconciling philosophy with religious doctrine seems to have been a defining feature of the 'Kindī-circle,' as it is also found in the works of his disciples; on this point, see the interesting article by Rowson (1990, especially 65 ff.). No such intention can be found in al-Fārābī's later works, at least when it comes to his metaphysical and cosmological theories.

[189] There are, of course, notable differences as well, particularly al-Fārābī's redefinition of theology as only one part of metaphysics. But even this point should not be overemphasized. For as the account in *Iḥṣāʾ* clearly shows, theology and the study of divine things occupy the most important place in the metaphysical project and also represent its culmination and overarching aim.

[190] See Zimmermann (1986, 131), whose study represents the most sustained attempt to reconstruct the genealogy of *Theology of Aristotle* and its original form in the Kindī-circle. This hypothesis also seems substantiated by the fact that al-Fārābī relied on Usṭāth's version of *Metaphysics*, which was originally part of this file; see Endress (1997a) and Bertolacci (2005b).

such as al-Kindī, al-Fārābī during his creationist phase, probably Isaac Israeli,[191] Ibn Suwār, and presumably others, did not interpret it in this fashion, surely with regard to the corporeal world, and perhaps even with regard to the intelligible world.

As P. Adamson has noted, the doctrine of creation this work puts forth is in many ways ambiguous, and it would have been relatively easy for the medieval authors to construe it through a creationist and non-eternalist lens.[192] For instance, the Adaptor (of *Theology of Aristotle*) at one point states that "the world is not abolished entirely," therefore implying that part of it (presumably its corporeal part) will perish. But even with respect to the intellectual world, the Adaptor hints at the potential finite existence of the immaterial beings: "the intellect does not dissolve or corrupt, but rather it endures forever and abidingly, unless He [God] wishes it [to go back] to [its] first state, that it perish."[193] Hence, we should note that the Adaptor, like al-Kindī, seems to uphold the *potential* perpetuity of the world, but also leaves open the possibility that God may want to destroy it at one point in the future. This ambiguity might explain why al-Fārābī in *Jamʿ* defends the thesis of the world's temporal finitude and contingency and at the same time relies on *Theology of Aristotle* to develop his creationist argumentation. The conclusion, then, is that the upholders of the cosmological paradigm described above probably construed the *Neoplatonica arabica* in a manner that suited their own creationist agenda. However, while it is clear that they conceived of the corporeal world as being temporally finite, contingent, and subject to future destruction, further research is required to settle the point of whether they also believed that the intellectual world would undergo such destruction.[194]

In any case, it should be noted that the main exponents of this creationist model defined themselves chiefly as philosophers and were operating outside of the main Muslim theological circles of their time.

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[191] At any rate, it was Wolfson's (1959, 12) view that this thinker defends a thesis of non-eternal creation.

[192] Adamson (2002a, 145, and note 59).

[193] Adamson (2002a, 145).

[194] The brevity of the metaphysical descriptions of *Iḥṣāʾ* and *Aghrāḍ* prevents any decisive conclusions in this regard, but this could very well be the view put forth in these works, i.e., that the corporeal *and* immaterial worlds were created all at once by God and will also perish. This would account for the postulation of various immaterial existents and for the strong creationist language and emphasis on divine omnipotence found in these works. The fact remains that on stylistic and doctrinal grounds, they are closer to the creationist treatises than to the emanationist ones.

Indeed, many theologians probably regarded this harmonization of philosophy and religion, as well as some aspects of their cosmogonical position, with suspicion. As we shall see in a later section, the various features constituting this creationist paradigm, as well as the fundamental intention of reconciling scripture and philosophy, will be either abandoned or profoundly transformed in al-Fārābī's later cosmological works. In that sense, and in spite of what some scholars have argued, the creationist picture articulated in *Jamʿ* and *Jawābāt* should definitely not be assimilated to the cosmology of al-Fārābī's emanationist treatises.

The intellectual milieu associated with the creationist paradigm identified above is defined primarily by the geographic and cultural centrality of Baghdad during this period. This urban environment enabled close interactions between religious and philosophical ideas, which are reflected in these thinkers' ongoing attempt to establish an adequate philosophical framework for religious tenets and thereby to make philosophy a legitimate and widely accepted activity. In al-Fārābī's creationist works in particular, there is a conspicuous tendency to Islamicize philosophy or to philosophize the Islamic revelation.[195] While this trend found a clear and outstanding embodiment in al-Fārābī's early treatises, it endured well into the tenth and eleventh centuries and found a new formulation—this time in relation to Christianity—in the works of the Baghdad thinkers who were directly or indirectly connected with al-Fārābī, such as Yaḥyā ibn ʿAdī and Ibn Suwār. In that sense, the previous analysis also sheds light on this later phase, in that it uncovers a new link and intellectual congruity between al-Fārābī and these Baghdad thinkers, who in many ways continued the cosmological project begun by their master.[196]

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[195] This conclusion has also been reached by other scholars with regard to al-Fārābī's logical treatises, many of which presumably belong to this 'early Baghdad phase' as well and display a similar approach. As Gutas (1993, 48, 50) writes, al-Fārābī's aim was to "acclimatize Greek philosophy to Arab/Muslim society" and to "incorporate Greek scientific methodology, i.e., Aristotelian logic, into Islamic sciences." As the above analysis showed, the same may be said about his theology and cosmology.

[196] It remains unclear to what extent al-Fārābī's own interest in the relation between religion and philosophy—apparent throughout his corpus, but formulated in different ways depending on his philosophical period—was indebted to his Christian teachers and the time he spent in the learned Syriac circles in Baghdad. Some scholars have argued that the main political concepts and themes found in al-Fārābī's works and traditionally defined as 'Fārābīan' *par excellence* may not have been elaborated by al-Fārābī himself and were widespread in the cosmopolitan and multi-religious environment that was ninth- and tenth-century Baghdad, although they flourished especially in the Christian circles; see Watt (2007) and Griffith (2007).

2.5. *Falsafat Arisṭūṭālīs*

In light of the foregoing, and turning to the rest of the Fārābīan corpus, it is worthwhile to examine the views expressed in al-Fārābī's other cosmological and metaphysical works and to assess their contents. How do they compare with regard to celestial matter and creation to the cluster of works examined previously? Do they also adopt the 'creationist paradigm' highlighted above? Or do they articulate other views on time and the existence of the universe?

As was shown earlier, *Falsafat Arisṭūṭālīs* articulates a revised version of the Aristotelian theory of aether. On the one hand, like *Radd*, it contrasts aether to the other four elements and establishes a qualitative distinction between sublunary and superlunary matter that is in line with the Peripatetic tradition. On the other hand, it mentions the form and matter (the hylomorphic nature) of aether and also defines it as the cause of the other elements, thereby departing slightly from *On the Heavens*. But what is the view on the creation of matter adopted in this treatise?

Al-Fārābī says very little about the question of the creation or eternity of the world in *Falsafat Arisṭūṭālīs*. This is somewhat surprising given that this work focuses not only on the logical and psychological doctrines of the Stagirite, but also on his physics.[197] There are nevertheless a few hints in the text suggesting that al-Fārābī upheld an eternalist position and ascribed eternalism to Aristotle as well. In one passage al-Fārābī mentions the infinite number of moved things; in another he describes the "perpetual circular motion" (*al-ḥarakah al-mustadīrah al-dāʾimah*) of the celestial bodies.[198] In addition, al-Fārābī discusses in detail the role of the Agent Intellect and the celestial bodies in sublunary generation and corruption, a theory which is characteristic of his emanationist treatises.[199] These hints are brief and do not constitute decisive evidence, but they definitely point to an eternalist position and suggest that al-Fārābī's interpretation of Aristotle's cosmology had evolved by the time he was writing this work. If this hypothesis is

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[197] The question remains why al-Fārābī is almost completely silent about Aristotelian metaphysics in *Falsafat Arisṭūṭālīs*. The hypothesis that the work is incomplete has been put forth, but it is more likely, in my view, that al-Fārābī intended to expound on this science in other treatises, as in his *K. al-wāḥid wa-l-waḥdah* (al-Fārābī 1989). Ibn al-Qifṭī (1903, 280) also attributes a *K. fī l-ʿilm al-ilāhī* to the Second Teacher, which is nonetheless not extant.

[198] Al-Fārābī (2001c, 102 and 129 respectively and 1961a, 130,13–14).

[199] Al-Fārābī (2001c, 128).

correct, then it would mean that al-Fārābī rejected the creationist position he combines with aether in *Jamʿ*, *Jawābāt*, and *Radd* and had already moved toward a conception of eternal causality, in a fashion akin to that expounded in the emanationist treatises.[200]

One point should be examined in more detail. Had al-Fārābī developed his theory of the separate intellects when he wrote *Falsafat Arisṭūṭālīs*? Does this treatise broach the topic of metaphysical causality and of an intermediary level of intellects between God and the material world? As was stated above, al-Fārābī says little about creation and causation in this treatise. Although it has been suggested that this is because he is describing Aristotle's philosophy and considered emanation foreign to the Stagirite' system, this omission can best be explained in my view by the fact that al-Fārābī restricts his survey to logic and natural philosophy and barely touches on metaphysical issues. Since al-Fārābī does not address metaphysics in this work in any depth, it is not surprising that the theme of immaterial causation is left out.[201]

In spite of this, some crucial evidence can be gleaned from this treatise with regard to secondary causation and the presence of an intermediate level of intellectual beings. When speaking about the rational faculty or intellect (*ʿaql*) in humans, for instance, al-Fārābī describes it as an "efficient principle" (*mabdaʾ fāʿil*), and "a cause and principle by way of finality" (*sabab wa-mabdaʾ ʿalā ṭarīq al-ghāyah*), formulations

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[200] In spite of this, anyone reading *Falsafat Arisṭūṭālīs* will be struck by the discretion with which the issue of the eternity of the world is treated. Neither in the section on *On the Heavens* with respect to aether, nor in the section on *Physics* with respect to time and motion does al-Fārābī emphasize this central Aristotelian tenet. It is possible to explain this oddity by arguing that al-Fārābī is concealing Aristotle's eternalist doctrine for ideological or political reasons. But this interpretation seems unconvincing, for the concept of eternity does appear briefly in several places in this work, although in no case is it the subject of an extensive discussion. Had it been al-Fārābī's primary intention to conceal the doctrine of eternity, he would have omitted these passages altogether. Rather, one may offer another interpretation. *Falsafat Arisṭūṭālīs* is actually quite representative of al-Fārābī's approach to the problem of creation and eternity, which fully acknowledges the difficulty of this problem and is reluctant to provide elaborate positive proofs to support it. As was intimated in chapter 1, 3.1, al-Fārābī perceived the question of the eternity of the world as an aporia that could not be answered in any general way, but which required careful analysis of its various components or aspects. The initial problem—in this case the world's eternity—has to be divided into individual issues or problems, and these issues should in turn be examined one by one by resorting to the appropriate discipline. *Falsafat Arisṭūṭālīs*, like these other Fārābīan works, seems to implicitly adopt this approach.

[201] Galston (1977) and Druart (1987a) are the main exponents of this view. According to them, *Falsafat Arisṭūṭālīs* is al-Fārābī's Peripatetic work *par excellence* and shows no contamination of Neoplatonic doctrine.

which already hint to a Neoplatonizing interpretation of Aristotelian noetics.[202] This is accentuated some lines later, when al-Fārābī posits the necessary existence of an Agent Intellect (*ʿaql faʿʿāl*) to account for human intellection. This Agent Intellect is always actual, separated from matter, eternal, and continuously acting on the sublunary world. It is a substance distinct from the human mind, which it actualizes, and it is, furthermore, not identifiable with God. It is defined as an efficient, final, and formal principle and governs, together with the celestial bodies, the realm of sublunary nature, where it participates in the processes of generation and corruption.[203]

This passage from *Falsafat* shows beyond doubt that al-Fārābī posited at least one intermediary separate intellect between the First and the sublunary world and that he ascribed this view to Aristotle. In doing so, he followed certain Neoplatonists in construing the active intellect vaguely described in *On the Soul* 3.4–5 as an eternal and separate substance endowed with causative powers. This conclusion is important in various respects. First, it undermines the view that al-Fārābī is expounding a pure or authentic Aristotelian doctrine in this work. Apart from the fact that it is contradicted by evidence drawn from the work itself, this interpretation suffers from its ahistorical character, which bypasses the influence that the secular tradition of late antique commentaries had on al-Fārābī. The foregoing analysis confirms that al-Fārābī relied on Neoplatonic material in most, if not all, of his 'Aristotelian' works to interpret the Stagirite, as was shown already in the case of *Iḥṣāʾ*, and as will also be shown later on in the case of *Fī l-ʿaql*.[204] *Falsafat Aristūṭālīs* is no exception, and it is likely that this would have been even more conspicuous had al-Fārābī included Aristotle's metaphysics in his survey. Second, and taken together with the hints pointing to an eternalist position, it shows that *Falsafat Aristūṭālīs* shares a metaphysical and cosmological connection with the late metaphysical treatises, *Ārāʾ* and *Siyāsah*. This work therefore does

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[202] Al-Fārābī (1961a, 122 and 2001c, 122). In a very Neoplatonic manner, al-Fārābī writes (1961a, 129,9–10) that Aristotle had to examine whether this Agent Intellect should not be regarded as the "cause of the existence of soul and of psychological things" (*sabab fī wujūd … al-nafs wa-l-ashyāʾ l-nafsāniyyah*).

[203] Al-Fārābī (2001c, 128–129). The structure of this entire part of the treatise is revealing. It proceeds from an analysis of nature, to soul, to intellect, and arranges these concepts in a neat hierarchical order, betraying a Neoplatonic framework. This is supported further by the doctrinal parallels between this work and the emanationist treatises.

[204] On this point, see also Vallat (2004, 129 ff.).

not contain theories that depart radically from al-Fārābī's emanationist treatises and which would justify a division of the Fārābian corpus in two opposed parts, an Aristotelian, and a Neoplatonic.

These results nevertheless do not enable us to decide whether al-Fārābī had already developed a full-fledged theory of the *thawānī* when writing this work, as he explicitly mentions only one intellect apart from God, i.e., the Agent Intellect. Regardless of this issue, *Falsafat Arisṭūṭālis* can be compared with the emanationist treatises on various points of doctrine: infinite time and motion, and the conception that time arises from the perpetual revolution of the heavens; the influence of the heavenly bodies on the sublunary elements; and the existence of a separate intellect (and possibly separate intellects) that exercises efficient and final causation on the sublunary world by intervening in human reflection and in the processes of generation and corruption.[205] In conclusion, then, and in spite of some ambiguity, our basic assumption concerning this work should be that it upholds some of the theories that later formed the crux of al-Fārābī's mature metaphysical treatises. This makes *Falsafat Arisṭūṭālīs* and its account of matter and causation—as brief as it is—an early sketch for *Ārāʾ* and *Siyāsah* and possibly a transitional work between *Jamʿ*, *Iḥṣāʾ*, and *Aghrāḍ*, and the emanationist treatises.

2.6. *The Eternalist Paradigm: Ārāʾ, Siyāsah, Taḥṣīl, Fuṣūl, and Fī l-ʿaql*

If there is a chance that al-Fārābī interpreted Aristotelian cosmology through a creationist lens during the early Baghdad period of his life, and that Aristotle's aether theory was thus combined with the belief in the creation of the world, al-Fārābī's more mature works indicate that his perception of these issues underwent considerable development later on in his life. This philosophical maturation is already apparent in *Falsafat Arisṭūṭālīs*, which mentions Aristotle's aether theory, but ignores creationism, and where several, albeit brief, statements point to a doctrine of eternal causation. But the eternalist position is developed in a much more consummated form in *Ārāʾ* and *Siyāsah*, while some essential features also appear in *Taḥṣīl*, *Fuṣūl*, and *Fī l-ʿaql*.

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[205] Naturally, there is the possibility that al-Fārābī could be defending the view of the potential infinity of time and motion in a way similar to al-Kindī and possibly Mattā ibn Yūnus, and thus that he would not uphold the eternity of the world in this treatise. However, its many parallels with the emanationist works and particularly the language of causation one finds in it suggest otherwise.

In these treatises, al-Fārābī not only rejects aether and any recognizable theory of celestial matter to provide a new formulation of the composition of the celestial bodies based on the concept of substrate. In addition, he also provides an entirely new account of the existence of the heavens and of the material world, which reflects a shift from a creationist paradigm to one of eternal causality that unfolds on several different ontological levels. In this new model, the concepts of demiurgy and efficient causation are extended to various metaphysical entities of an intellectual nature (called *al-thawānī*), which are responsible for causing the existence of the various celestial bodies. In turn, these celestial bodies act on the sublunary world through their powers and motions and cause the existence of prime matter (*al-māddah al-ūlā*), which underlies the process of change in all the hylomorphic existents. One striking feature of this scheme is that the First is not involved directly in the creation of matter—both of the celestial substance and sublunary prime matter—since it only causes the existence of a single immaterial being.

Some key features of this eternalist model of causation appear in *Taḥṣīl*. While this work does not dwell on this subject, one passage in particular allows us to assess the nature of al-Fārābī's metaphysics at this stage in his life and to situate this work vis-à-vis the later emanationist treatises. In the context of describing the metaphysical method and its subject matter, al-Fārābī explains that the metaphysical inquiry will eventually result in the postulation of a being to which the four causes do not apply and which will itself be the First Principle (*al-mabdaʾ l-awwal*) of all the other beings. This being about which al-Fārābī speaks is none other than the First, which receives a detailed treatment in the opening part of *Ārāʾ*. Al-Fārābī then mentions the other metaphysical beings:

> When he [the philosopher] reaches this stage, he should examine after this whatever occurs necessarily in the [other] existents if [it is posited] that this existence is their principle and the cause of their existence [*fa-idhā waqafa ʿalā hādhā faḥaṣa baʿd dhālika ʿammā yalzamu an yaḥṣula fī l-mawjūdāt idhā kāna dhālika l-wujūd mabdaʾahā wa-sabab wujūdihā*]. He begins with the existent which is most prior and closest to this existence [i.e., the First], until he reaches the last existent in rank and the most remote to this existence.[206]

[206] Al-Fārābī (1981b, 62–63, my translation). In this convoluted passage, al-Fārābī seems to be referring to the First as *al-wujūd*, a term normally used to express the

Since al-Fārābī is focusing on metaphysics in this passage, there can be little doubt that the other existents he mentions apart from the First are the *thawānī*, the immaterial intellectual beings whose subsistence depends on the First Principle. This is confirmed by two points. First, by the hierarchy he establishes between the intellects, which defines some as being metaphysically and causally prior or "close" to the First and others as being posterior or "remote" from It. This hierarchy also helps to explain the order of the various levels of the visible heavens in the other metaphysical treatises, each level being caused by an intellect.[207] Second, the terminology, which relies chiefly on the terms *lazima ʿan* and *ḥaṣala ʿan*, is distinctive and is the same that appears in *Ārāʾ* and *Siyāsah*. What is more, al-Fārābī defines the First Principle as a "cause of existence" (*sabab wujūdihā*) for these separate entities, and not merely as a final cause of motion for the universe, and he also refers to the other intellects themselves as causes (*asbāb*) and as "the divine principles" (*al-mabādiʾ l-ilāhiyyah*).[208] In spite of its brevity, then, this passage shows that al-Fārābī's theory of the *thawānī* and most likely his corollary theory of eternal efficient and final causation were already formulated when he composed this treatise, which should be connected with his late works, *Ārāʾ* and *Siyāsah*.

A very similar picture can be found in *Fī l-ʿaql*.[209] There the separate intellects are defined not only as final causes of motion for the orbs, that is, as movers (sing. *muḥarrik*), but also as causes of existence: each separate intellect is "the cause of [the celestial body's] existence [*fa-innahū huwa sabab fī wujūdihī*]." This proves that this treatise goes beyond the Aristotelian cosmology exposed in Book Lambda in attributing efficient causality to each unmoved mover. While it is not spelled out, this treatise implicitly endorses the same cosmology as the one articulated in the late metaphysical treatises: the First, which is the ultimate principle of existence, towers the metaphysical hierarchy; then

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universal concept of existence, and which, to my knowledge, is not employed in a similar way in his other treatises. The general meaning of this quotation is nevertheless clear, as it oulines the rank and essential priority and posteriority of the *thawānī*.

[207] Cf. al-Fārābī (1985a, 101–105, 112–115 and 1985b, 61 ff.).

[208] Al-Fārābī (1981b, 63). Studying the activity of these intellects will also enable the philosopher to acquire "knowledge of the most remote causes of the existents" (*maʿrifat al-mawjūdāt bi-aqṣā asbābihā*).

[209] The passage in question (al-Fārābī 1938, 34–35), which is a valuable piece of evidence, was already briefly mentioned in chapter 1 and will be further discussed in chapter 4 with regard to celestial motion.

follow the separate intellects, explicitly defined both as final and efficient causes; and finally the celestial bodies, which derive their existence and motion from these higher principles and in turn act on sublunary nature. Both the doctrines and terminology of *Fī l-ʿaql* are strikingly similar to those in *Ārāʾ* and *Siyāsah*, and these works convey a common paradigm of efficient and final causality that hinges on the activity of the *thawānī*. Given these facts, it is difficult to understand on what grounds some scholars have described this treatise as a faithful exposition of the Stagirite's doctrine and as belonging to al-Fārābī's "Aristotelian texts."[210] The early date of composition that has sometimes been proposed for *Fī l-ʿaql* cannot be accepted without hesitation, and it is rather tempting in the frame of the developmentalist hypothesis to connect it with a later period in al-Fārābī's life.

It is, however, in al-Fārābī's two latest works, *Ārāʾ* and *Siyāsah*, that one gets the deepest insight into his eternalist causative model. In order to better grasp the doctrinal subtleties developed in these treatises, it is necessary to take a closer look at al-Fārābī's terminology of causation and at the role that the First and the secondary intellects play in this causal scheme. Emphasis will be placed on the connection between intellection and causation and on how the corporeal beings are said to emerge from these principles.

To begin with, let us examine the causative activity of the First. Al-Fārābī uses several Arabic terms to describe the way in which other beings are caused to exist by the First's intellectual activity. An investigation of his metaphysical treatises reveals that these terms consist mostly of the roots *f-y-ḍ*, *l-z-m*, *ḥ-ṣ-l*, and *w-j-d*. In *Ārāʾ* for instance, one reads that "the First is that from which existence is brought about [*ʿanhu wujida*]," that "the substance of the First is a substance from which every existent emanates [*tafīḍu ʿanhu*]," and that "the substance of the First is also such that when the existents are derived [*idhā ḥaṣalat [ʿanhu] l-mawjūdāt*], they are necessarily united and connected with one another."[211]

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[210] Druart (1987a, especially 25), where the author claims that the last sections of *Fī l-ʿaql* "do not speak of emanation." Indeed, the term *fayḍ* does not appear here, but this passage explicitly speaks of the final *and* efficient causation of the separate intellects and stresses their status as causes of existence for the celestial orbs, which is a major elaboration on Aristotle's cosmology. As will be argued shortly, al-Fārābī did not develop a special concept of "emanation" that can be distinguished from his general theory of efficient and final causation.

[211] Al-Fārābī (1985a, 88–89, 94–97, translation revised, and 1985b, 55 ff.).

Two points are worth noting from the outset. The first is the complete absence of the roots *b-d-ʿ* and *kh-l-q* to describe the First Cause in al-Fārābī's works. Since these roots were used frequently by al-Kindī and the early Muslim theologians, this omission should certainly not be seen as coincidental, but rather as a deliberate choice on al-Fārābī's part to avoid any association with these previous and/or contemporary doctrines. It is notable that, on this point, al-Fārābī also departs from Ibn Sīnā, who occasionally uses the terms *ibdāʿ* and *khalq* to define God's creation.[212] Second, in spite of repeated attempts by scholars to emphasize or particularize the concept of 'emanation' or the 'overflowing of being' (expressed by terms from the root *f-y-ḍ*) in al-Fārābī's cosmology, it is far from clear that these terms possess a special and distinctive meaning that differs from that of the other roots expressing efficient causation.[213] In fact, there does not seem to be any significant semantic differences between *fāḍa ʿan* and the other verbal constructions used by al-Fārābī, such as *lazima ʿan* and *ḥaṣala ʿan*.[214] All of them are employed in their intransitive form and aim primarily at expressing the atemporal causal connection between an effect and its cause and the dependence of the lower existents on the First. Although al-Fārābī does not define these terms in his works, there are no hints suggesting

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[212] Janssens (1997) and Lizzini (2011).

[213] See for instance Goichon (1938, 290–291), who translates *fayḍ* as "débordement," "écoulement," "flux"; cf. Madkour (1934, especially 73 ff.), Walzer (in al-Fārābī 1985a, 354–355), Fakhry (2002, 77 ff.), Druart (1987a and 1992), Netton (1989, 114–149), Hasnawi (1990), and Lizzini (2011), whose book is largely devoted to this concept in Ibn Sīnā's philosophy, but also contains interesting information on al-Fārābī.

[214] Al-Fārābī's terminology of causation overlaps with that of *Neoplatonica arabica*, especially *Proclus arabus*, and there can be little doubt that he relied partly on this corpus to elaborate his metaphysical vocabulary. I will not address the question here of whether these works attribute different meanings to these roots, and will limit the analysis to al-Fārābī. For further insight into this issue and comparative analyses, see Hasnawi (1990), Janos (2010a), and Lizzini (2011, passim). The root *f-y-ḍ* appears in most of the Arabic Neoplatonic works, as in *Theology of Aristotle* (Badawī 1977b, 27, 61 and passim) and *Maḥḍ al-khayr* (Badawī 1977a, 2, 7, and passim). It is unclear how al-Fārābī came to adopt the root *l-z-m* as the main verbal construction of his mature metaphysics. This root appears only sparsely in *Maḥḍ al-khayr* (Badawī 1977a, Proposition 1, 4 and Taylor 1981, 284–285), although it seems to convey a meaning close to the one expressed in al-Fārābī's works: "And when the second cause detaches itself from its effect, the First Cause does not separate Itself from it, because the act of the First Cause is greater and stronger in terms of entailment [or necessity, *aʿẓam wa-ashadd luzūman*; Taylor's translation of *luzūman* as "adherent to" seems to weaken the meaning of the sentence] vis-à-vis the thing than the act of its proximate cause." In both *Maḥḍ al-khayr* and al-Fārābī, this root seems to express logical entailment and necessary causality.

that the root *f-y-ḍ* is meant to evoke a different metaphysical aspect or meaning, be it even at the metaphorical level.[215]

The primary concern for al-Fārābī in these various passages is to express the concept of efficient causality and the corollary notion of necessary entailment. These concepts are used as a means of organizing the various immaterial beings in terms of their essential priority and posteriority vis-à-vis one another and vis-à-vis the First. While these concepts have their roots in Aristotle to some extent, the Second Teacher is, in this instance, elaborating a new metaphysical hierarchy in light of Ammonian and other Neoplatonic influences, which applied efficient causality to the entities of the superlunary world and especially to Aristotle's First Unmoved Mover. Like many of these late antique thinkers, al-Fārābī conceives of the First's causation of the world as an atemporal act, whichever of the above-mentioned Arabic terms is employed. This means that this act or activity does not take place in time—time already being in existence—or over a period of time.[216] The causation deriving from the First rather unfolds in a timeless realm and from all eternity. It is even possible that al-Fārābī, following the *Proclus arabus*, would have envisaged the causative activity of the First as lying beyond eternity itself, since this concept is associated with the eternal and constant motion (*ḥarakah sarmadiyyah* or *dāʾimah*) of the celestial bodies in his philosophy. Regardless of this

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[215] Indeed, the sun and source analogies, as used for instance by Plotinus in *Enneads* 1.7.1, are absent from al-Fārābī's metaphysical descriptions of the First. It should be noted that the other terms frequently used to express the concept of emanation in the *Neoplatonica arabica* and in the Arabic works influenced by this corpus, especially the terms *inbijās* and *inbiʿāth*, are absent from al-Fārābī's treatises. On the other hand, al-Fārābī (1986, 81) uses the rarer verb *ḥadatha ʿan* in one instance in his metaphysical account of *Fuṣūl mabādiʾ*. At first glance this might appear more surprising, since this term was commonly used in the theological tradition to express creation *ex nihilo* in time, and since it also appears in al-Fārābī's early creationist works. But in this case as well, al-Fārābī seems to use it synonymously with the other verbal constructions to express eternal causation, and it is thus virtually impossible to perceive any significant variation in meaning.

[216] This is one of the rare doctrines shared both by al-Fārābī's creationist works and his late metaphysical treatises, but atemporal creation or causation means something quite different in both instances. As we have seen, in the case of *Jamʿ* and *Jawābāt*, it is merely meant to distinguish God's creation from the accounts given in scriptures, which describe the time period during which God created the various parts of the world, and which was construed literally by many Christians and Muslims. Atemporal creation is, moreover, combined with the notion of the temporal finitude of the world, i.e., that the world has both a beginning and an end. In the late metaphysical works, in contrast, it is merely meant to qualify a causal activity that is essentially tied to the intellection of the immaterial beings and that unfolds in an atemporal sphere.

point, it is important to stress that the First Cause induces existence as a result of Its self-intellection. Intellection or thought is the very essence of the First, and it is from this activity that the lower existents emerge.

But al-Fārābī's account of causation with respect to the First is undermined by ambiguity. On the one hand, the First is described as *the* first and fundamental cause of all things. On the other hand, it is said to cause only one effect, the first separate intellect, with the implication that this effect in turn becomes the proximate cause of existence of what lies beneath it. We thus seem to be faced with two different and incompatible views of how the existents and the world as a whole relate to the First. This dual account represents a tension, if not a contradiction, in al-Fārābī's system, although it is also a problem that underlies much of Neoplatonic metaphysics.[217] This tension acquired a new significance in *falsafah*, as a result of the close interaction that developed between philosophy and theology in Islam and of the doctrinal and creedal emphasis on divine oneness and simplicity. In the case of al-Fārābī's metaphysics, however, it is further compounded by the way in which he describes the causative activity of the secondary causes, the *thawānī*. As the modern scholarship has not precisely defined the role of these causes in al-Fārābī's metaphysics, it is worth devoting some space to a comparative analysis between the *thawānī* and the First with respect to causation. The following analysis will cast in an even starker light the different facets underlying al-Fārābī's account of divine causality.[218]

In parallel to the exclusive status of the First as the cause of all beings, al-Fārābī articulates another theory that endows the separate intellects or *thawānī* with a significant power and autonomy of their own and defines them as purveyors of existence for the lower entities. With this question, we reach one of the crucial stages in the development of al-Fārābī's cosmology. For although the Second Teacher's cosmological model is in many ways indebted to Aristotle's Book Lambda and its late antique commentaries, there was no precedent in the Aristotelian tradition for transforming each separate unmoved mover into a cause

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[217] This tension, I believe, is also a direct outcome of the historical development of al-Fārābī's metaphysics as argued in this book. It will be exacerbated by the following discussion of the causation of the separate intellects.

[218] The term divine (*ilāhī*) should, especially from this point onward, be understood as applying to all the immaterial entities of al-Fārābī's cosmology, and not just to the First. This is the sense conveyed in *Taḥṣīl* (1981b, 63), when he defines the separate intellects as the "divine principles" (*al-mabādiʾ l-ilāhiyyah*).

responsible for the existence of other intellects as well as each heavenly orb. One may legitimately hypothesize, as I did in a recent article, and as was also intimated in chapter 2, that al-Fārābī was the author of this innovation and that he developed this cosmological proposition by applying Neoplatonic, and more specifically Proclean, theories of causation and demiurgy to the Aristotelian doctrine of the unmoved movers.[219] This hypothesis, which is supported by the wide circulation of Arabic versions of Proclus' *Elements* in tenth-century Baghdad and by the many terminological and doctrinal parallels between it and al-Fārābī's works, will be further explored in the following paragraphs.

2.6.1. *The Causative Powers of the Separate Intellects*

In al-Fārābī's cosmological system, the various levels of the heavens are caused to exist by the separate intellects and not by the First directly. By reflecting on the First or God, Who is the ultimate principle of their existence, each intellect produces a lower separate intellect, and by thinking its own essence, it produces a celestial orb and its soul. Yet a frequent assumption made by scholars is that al-Fārābī followed the *Neoplatonica arabica* in regarding the separate intellects merely as intermediaries between God and the lower existents. On this view, these intellects would be responsible for transmitting the divine creative power to the principle of soul and the corporeal beings. But is this really an accurate description of al-Fārābī's metaphysics?

Understanding how al-Fārābī relates to the Greek and Arabic Proclus with regard to this particular issue of mediation (*tawassuṭ*) and the role of the separate intellects is crucial in order to fully grasp the scope of his originality. Let us begin by examining al-Fārābī's vocabulary of causation. The most common term found in al-Fārābī's treatises to express the relation between the separate intellects and their effects is *lazima ʿan*, "to follow necessarily from." In *Ārāʾ*, for instance, it is said that "as a result of its [the first separate intellect after God] thinking of the First [God], a third existent follows necessarily from [*lazima ʿan*] it."[220] This verbal construction stresses the dependence of the intellects and heavenly bodies *qua* effects on the higher intellectual principles that precede them essentially. In this context, the terms *lazima ʿan* first and foremost express necessary connection or logical entailment, together

[219] See Janos (2010a) and chapter 2, 2.1–2.
[220] Al-Fārābī (1985a, 100–101, 1985b, 61, and 1964, 32).

with the notion of concomitance, since this connection exists in a realm that transcends time. Indeed, in al-Fārābī's metaphysics, *lazima ʿan* and the derived term *luzūm* denote both necessary consequence and ontological concomitance due to the atemporal character of the relation between these metaphysical entities.[221]

But this verb may also express causation in a more straightforward way. Al-Fārābī explicitly describes the separate intellects as "causes" (*asbāb*) in *Siyāsah*,[222] and by this term there can be no doubt that he means *causes of existence*, that is, efficient causes responsible for bringing about the existence of lower celestial entities. This appears clearly when he writes that "the secondary causes are the causes *of the existence* of the celestial bodies [*al-thawānī hiya asbāb wujūd al-ajsām al-samāwiyyah*]" and that "the *existence* [*wujūd*] of each one of the celestial bodies is a necessary consequence [*yalzamu ʿanhu*] of them [the separate intellects]."[223] Finally, al-Fārābī states in *Siyāsah* that "the *existence* [*wujūd*] of each heaven emanates from [*yafīḍu min*] the existence of each [separate intellect]."[224]

Several points are worth stressing here. First, and as stated above, al-Fārābī explicitly describes the separate intellects as *proximate causes of existence* and efficient causes for the beings below them. On this point he departs markedly from the *Proclus arabus*, where intellect is merely a purveyor of form for the soul and an intermediary between the First and the lower beings. This appears clearly in Proposition 3 of

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[221] Cf. Goichon (1938, 364–365) with respect to Ibn Sīnā's metaphysics.

[222] Al-Fārābī (1964, 31).

[223] Al-Fārābī (1964, 31–32) and McGinnis and Reisman (2007, 82, my emphasis). The verbal construction *ḥasala ʿan* is also used in this work in a similar context and conveys virtually the same meaning as *lazima ʿan*.

[224] Al-Fārābī (1964, 53). This is, to my knowledge, the only occurrence of the root *f-y-ḍ* in connection with the separate intellects and the celestial bodies in al-Fārābī's works. Yet, this single occurrence is sufficient to show that Walzer's claim (in al-Fārābī 1985a, 355–356) that this term possesses a special meaning and that al-Fārābī reserves it to express the creation of the first effect by God is incorrect. This root also appears in *Maḥḍ al-khayr* (Badawī 1977a, Proposition 4, 7; Proposition 23, 24; Taylor 1981, 290, 321) and *Liber de causis II* (Thillet and Oudaimah 2001–2002, Proposition 12, 330–331), sometimes in connection with the principle of intellect, but it seems to serve merely as a way to emphasize its role in mediation. McGinnis and Reisman (2007, 94) do not translate the terms *yafīḍu min* that appear in al-Fārābī's *Siyāsah* as "emanate from," but as "bestow the existence of," thus transforming the verbal construction into a transitive one. This choice, however, seems unjustified, for in this case the verbal form would have to be *yūfīḍu*. At any rate, McGinnis and Reisman's translation rightly avoids, in my opinion, the term 'emanation' and thus implicitly questions the singularity of this concept in al-Fārābī's philosophy.

Maḥḍ al-khayr, which states that the First Cause "created [*abdaʿat*] the being of the soul through the mediation of the intellect [*bi-tawassuṭ al-ʿaql*]," and in Proposition 17, where it is stated that "the intellect gives knowledge and the other things to what is below it in the manner of form, not in the manner of origination [*bi-nawʿ ṣūratin lā bi-nawʿ ibdāʿin*], because the manner of origination belongs to the First Cause alone."[225]

Second, these passages show that al-Fārābī uses the exact same terminology to express the causative power of the First and the *thawānī*. In other words, the first separate intellect "emanates from" and is "necessarily caused" by God, but in the same way the celestial souls and orbs are also said to "emanate from" and to be "necessarily caused" by the separate intellects. Hence, the verbs *lazima ʿan* and *fāḍa ʿan* are applied with a similar meaning and aim to the First and the separate intellects. Al-Fārābī makes no distinction between these entities' mode of causation at the terminological and conceptual levels. This in turn further invalidates the idea put forth by some scholars that al-Fārābī applied a special language of emanation to the First to distinguish and particularize Its creative activity. On the contrary, we see that al-Fārābī uses the various terms expressing causation synonymously and that he applies them to all the intellectual beings of this metaphysics, the *thawānī* as well as the First.[226] It is significant that al-Fārābī departs markedly on this last point from the *Neoplatonica arabica*, which

[225] Badawī (1977a, 5–6, 19). For insightful discussions of the concept of mediation in *Maḥḍ al-khayr* and *Liber de causis*, see D'Ancona (1995), and in *Theology of Aristotle*, Adamson (2002a, 137 ff.).

[226] As mentioned above, the fundamental meaning attached to these verbs is one of atemporal causation expressing a necessary connection between a cause and its effect. Although the translation of *fāḍa ʿan* as "to emanate" will be preserved in this book for the sake of terminological diversity and to avoid repetitions, no special metaphysical meaning will be attributed to this root, and it will be treated as a synonym to *lazima ʿan* and the other terms expressing causation and logical entailment. The fact that al-Fārābī does not limit the root *f-y-ḍ* to the First, and the fact that it carries no special metaphysical meaning invalidate the attempt made by some scholars to divide the Fārābian corpus into Neoplatonic and Aristotelian works. For if emanation is collapsable into the more fundamental concept of efficient causation, then this concept also appears in works deemed 'Aristotelian' by these scholars, such as *Fī l-ʿaql* and *Falsafat Arisṭūṭālīs* to a lesser degree. In any case, al-Fārābī's allegiance to Neoplatonism should not be limited to this issue. In light of recent studies on al-Fārābī's noetics and metaphysics, such as Geoffroy (2002), Vallat (2004), and Janos (2010a), as well as the many parallels between al-Fārābī's doctrines and *Proclus arabus* that are highlighted in this study, one may justifiably call some aspects of al-Fārābī's metaphysics and noetics Neoplatonic, regardless of the place of 'emanationism' in it.

reserve a specific terminology derived from the roots *b-d-ʿ* and *kh-l-q* for God in order to distinguish His authentic creative act from the mere mediatory role of intellect and its 'information' of the soul.[227] In contrast, al-Fārābī made a conscious effort to shun the roots *b-d-ʿ* and *kh-l-q* in his works. This shows that he envisaged his terminology of causation as being fundamentally different from the language used not only by the *mutakallimūn*, but also in the Arabic Neoplatonic works.[228]

Furthermore, there is a passage in *Siyāsah* that deserves close attention. At one point, al-Fārābī writes that "on its own it [i.e., each separate intellect] is capable of bringing something else into being [*iyjād ghayrihī*] *without seeking the help of any instrument or circumstance beyond its own substance*."[229] This striking statement is a crucial piece of evidence for my overarching argument. The formula *iyjād ghayrihī* ("bringing something else into being") used in this sentence implies much more than logical derivation or causative intermediacy. It rather posits an autonomous and self-contained power in the separate intellects that can give being to other entities. This statement explicitly stresses the active, demiurgic role of the intellects in the production of the lower celestial existents in al-Fārābī's ontological hierarchy.[230] Moreover, it is clear from this passage that the *intellects themselves* do not need an instrument or an intermediary to assist them in the production of the lower entities. According to al-Fārābī, the intellects can, like the First, produce other existents directly without relying on anything else but their own substance.

In conclusion, not only are al-Fārābī's separate intellects *not* intermediaries in God's creation in the way portrayed in the *Neoplatonica*

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[227] In this respect, al-Fārābī also differs from other Arabic thinkers who adapt their terminology according to their metaphysical hierarchy. This is the case of al-Kirmānī, for instance, who reserves the term *ibdāʿ* when speaking about God's creation, but uses other terms to describe the causation of the intellects; see De Smet (1995, 147 ff.).

[228] In this connection, the two references to al-Fārābī given by De Smet (1995, 116, note 100) in the context of his discussion of *ibdāʿ* cannot be relied upon: both *Daʿāwā* and *ʿUyūn* are likely to have been composed in the Ibn Sīnā circle—but then De Smet himself calls *ʿUyūn*'s author "Ps.-Fārābī."

[229] Al-Fārābī (1964, 41) and McGinnis and Reisman (2007, 87).

[230] This point is further strengthened by the fact that al-Fārābī also uses other terms derived from the root *w-j-d* in connection with God's creation of the world, as can be seen for instance in *Ārāʾ* (al-Fārābī 1985a, 88–89 and 1985b, 55). Here again, we observe that a verb expressing causation or creation is applied to the First and the separate intellects with an identical intention and meaning.

arabica, but in addition they themselves do not need any intermediaries to produce other beings and therefore possess unmediated demiurgic powers. In this respect, they are the direct and absolute causes of existence of the celestial souls and bodies. This is again contrary to the Arabic Neoplatonic texts, which describe soul as the intermediary between intellect and nature or corporeality.[231]

For all of these reasons, it appears that al-Fārābī's metaphysics in many ways endows the intellects with a high degree of autonomy and a demiurgic power of their own, which is not directly derived from that of the First. The intellects do not passively communicate the First's causative power. On the contrary, through their own power and intellectual activity, they participate in the production and multiplication of existence (*wujūd*). The causative activity of the First and the separate intellects occurs as a result of their contemplation. In the case of the First, this intellection is purely self-reflexive, whereas in the case of the *thawānī*, it is both self-reflexive and oriented at another higher intelligible, namely the First. Each intellect is therefore characterized by a unique intellection that produces unique effects, which are suited to its own nature and being. In this regard, al-Fārābī is quite close to the Greek Proclus, who posits a multiplicity of immaterial beings that produce other entities through their (self-reflexive) intellection.[232]

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[231] Thillet and Oudaimah (2001–2002, Proposition 23, 346–347).

[232] One should bear in mind that Proclus, unlike al-Fārābī, generally does not describe the highest entity of his metaphysics, i.e., the One, as an intellect. A compelling, and in some ways overlapping, analysis of causality with regard to the First and the *thawānī* is given by Vallat ("Al-Farabi's arguments for the Eternity of the World," forthcoming). However, I do not concur with Vallat on one point. The author argues that the *thawānī* should be regarded as autonomous existents, which "do not depend on the First for their own subsistence" (19; see also 15, 17). Vallat also concludes that al-Fārābī's intellects are in fact comparable to Proclus' *authupostata*. While this interpretation agrees with my own argument in connecting al-Fārābī's separate intellects with the metaphysical beings of Proclus' philosophy, it, on the other hand, seems to go too far in stressing their complete autonomy. Vallat's claim seems to be undermined by the equation al-Fārābī establishes between the subsistence of the *thawānī* and their intellection of the First. It is their sustained contemplation of the First, which is their main object of intellection, which enables them to exist and subsist actually *qua* intellective beings, and in that sense their subsistence directly depends on It. Their intellection, which expresses the cosmic movement of reversion toward the First and thus Its role as a final cause, is also what enables the *thawānī* to cause the existence of lower beings, so that both their own existence and their causing existence in other entities are equally tied to their act of contemplating the First. Vallat's conclusion is all the more difficult to accept, since he simultaneously stresses the primacy of final causality in al-Fārābī's metaphysics. As chapter 2 argued, and as the present

2.6.2. *Syrianus, Proclus, and al-Fārābī on Causation and Intellection*

This last point on the connection between intellection and causation will be explored in more depth. It should be noted that since intellection is the only activity that characterizes the immaterial beings, it is necessarily as a result of their contemplation that they are able to produce the lower effects. In other words, intellection and causation appear to be essentially linked in al-Fārābī's account, to the point that the principle of intellection possesses an inherent demiurgic power.[233]

Now, according to Proposition 193 of *Elements*, each soul has its origin in an intellect and proceeds from an intellect. The link between the souls and intellects is also discussed in Propositions 166 and 182. And again in Proposition 160, Proclus writes that the "divine intelligence … produces the others from its own being." Intellect is therefore a demiurgic principle in Proclus' metaphysics, and one responsible among other things for the existence of soul. Furthermore, Proclus explains that creation occurs through intellection. For each intellect, he says, "its creative activity is in thinking, and its thought is in creating [ἡ ποίησις ἐν τῷ νοεῖν καὶ ἡ νόησις ἐν τῷ ποιεῖν]."[234]

Proclus provides further information on the various intellects considered as minor demiurges in his commentary on *Timaeus*, a subject covered in detail by J. Opsomer and J. Dillon.[235] What is important for our purposes is that Proclus recognizes a whole series of secondary demiurges below the main Demiurge mentioned in *Timaeus*. These demiurges are also intellectual beings that are responsible for the creation of the lower entities such as the souls. In Proclus' cosmology, then, there is a variety of minor creator-gods who create through

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discussion also shows, efficient and final causality are two sides of the same coin in al-Fārābī's metaphysics. In any case, the above analysis raises a new question: on what grounds can one distinguish the First from the *thawānī*, given that they possess a common immaterial nature and cause the existence of other beings in a similar way through their intellection? A brief answer is that these immaterial entities can be differentiated in two crucial regards. First, their essences possess a varying degree of simplicity. While the First is absolutely simple, the *thawānī* are affected by a small degree of multiplicity (*kathrah*). Second, the First is not subject to any higher cause, even a final cause, whereas the *thawānī* owe their actual state to higher efficient and final causes. It is chiefly on these two points that one may distinguish the various causes of al-Fārābī's metaphysics.

[233] The connection between causation and intellection is stressed in al-Fārābī's emanationist treatises, *Ārāʾ* and *Siyāsah*, as well as in *Fī l-ʿaql* (1985a, 100–105, 116–117, 1964, 52, and 1938, 35 respectively).

[234] Proclus (1963, 174,8–9).

[235] Opsomer (2000 and 2001) and Dillon (2000, 344–345).

intellection, and who are not presented merely as intermediaries, but as genuine demiurges of the cosmic beings. These passages show that al-Fārābī followed his Greek predecessor on three crucial counts: in deriving the cosmological principle of soul from the principle of intellect, in defining causation as an inherently intellectual act or activity, and, finally, in positing a multiplicity of intellectual entities endowed with demiurgic powers.

It is nevertheless interesting to note that this aspect of Proclus' philosophy was considerably watered-down by the Muslim and Christian adaptors who received and studied the Greek Neoplatonic works. Their objective as monotheists was to preserve or re-establish the divine omnipotence and the absolute priority of God in matters of creation. They accomplished this in two ways. First and as previously mentioned, they used the root *b-d-ʿ* to express God's absolute creation of intellect or of the world as a whole.[236] Second, the principle of intellect itself is stripped of any real demiurgic ability and is described as an intermediary through which God's creation or emanation filters. In one passage of *Maḥḍ al-khayr*, for instance, God is said to create the "being of soul," while intellect is merely responsible for endowing it with intellective powers.[237] *Liber II*, the other known recension of *Maḥḍ al-khayr*, states that the First Cause "created the intellect without any intermediary and created soul and nature through the intermediary of intellect."[238] *Theology of Aristotle* and *Sayings of the Greek Sage* uphold a similar view.[239] Hence, *Proclus arabus* does not connect intellect and causation in the way that both the Greek Proclus and al-Fārābī do. When compared to the *Neoplatonica arabica*, al-Fārābī's theory of the *thawānī* is in many ways closer to Proclus' doctrine of the minor demiurges as articulated in his Greek works than to the Arabic adaptations of these works.[240]

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[236] Indeed, God is presented as the sole innovator of the world, and a whole array of traditional Arabic terms is used to describe his demiurgic power, such as *al-mubdiʿ*, *al-bādiʾ*, and *al-khāliq*, as in *Theology of Aristotle* (Badawī 1977b, 24–27 passim).

[237] Taylor (1981, Proposition 3, 287,12–15).

[238] Thillet and Oudaimah (2001–2002, Proposition 22).

[239] Badawī (1977b, 134–135 and 167 ff. passim) and Lewis (1959, 281, 291).

[240] This, naturally, does not imply that al-Fārābī read Proclus' works in Greek, but it underlines the important fact that he approached these works critically and adapted and transformed their contents. This also raises the question of which kind of compilation or edition of Proclus' works al-Fārābī had access to, which might not have been exactly the same as the ones handed down to us by the Arabic tradition.

There is another Neoplatonic source that was translated into Arabic and that may have contributed to shaping al-Fārābī's theory of the separate intellects, namely, Syrianus' commentary on *Metaphysics*. Syrianus (d. ca. 437 CE) succeeded Plutarch as head of the Neoplatonic school of Athens and was also the master of Proclus. Hence, it is hardly surprising to find a continuous line of thought on this subject running from him and his disciple Proclus, through the Arabic translators and adaptors, to al-Fārābī himself. While Syrianus' commentary on *Metaphysics* has survived only incompletely, there is sufficient evidence in its remaining parts to conclude that he posited various separate, intellectual principles, and that he made these principles responsible for the creation of the heavens. According to Syrianus, there are "divine and unmoved separable causal principles of the whole cosmos."[241] These principles, it should be noted, are explicitly defined as efficient causes: they have "creative causality" and are "causes of existence."[242] Interestingly, Syrianus further distinguishes between general and specific or particular causes, the latter being responsible for the causation of the various heavenly orbs. He writes:

> One must postulate that within Intellect there are more general causal principles and others that are more particular, seeing as Aristotle himself, in admitting that there is the same order pervading the visible celestial spheres in the aether as is possessed by the intellectual causes of the universe, is plainly agreeing that some of them are more comprehensive and others are particular.[243]

As in al-Fārābī's cosmology, then, specific intellectual causes are responsible for the causation of the various heavenly orbs, even though all of them share a common immaterial nature. The fact that Syrianus' statement appears in a commentary on *Metaphysics* indicates that he regarded this interpretation essentially as an elaboration on Aristotle's theory of the unmoved movers, but one which was nevertheless fully compatible with Aristotelian metaphysics. Although this aspect is not emphasized in the surviving parts of his commentary, it is clear that these causes operate as a result of their intellection. The idea that immaterial causes are responsible for the creation of the world through their intellectual or contemplative activity was standard in Greek

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[241] Syrianus (2006, 80,12–13).
[242] Syrianus (2006, 117,28 ff.).
[243] Syrianus (2006, 119,22–25).

Neoplatonism and was elaborated in depth by some thinkers such as Proclus. It appears clearly when Syrianus writes that the forms are always "within" intellect and "create inasmuch as they are Intellect."[244]

The above clearly shows that Syrianus—in a way even more apparent than Proclus due to the nature of this work, i.e., a commentary on Aristotle's *Metaphysics*—anticipated al-Fārābī in construing the Aristotelian unmoved movers as separate efficient causes responsible for the existence of the visible heavens. His commentary also contains the crucial idea that these causes are intellectual beings that possess demiurgic powers by virtue of their intellection. On these grounds, one cannot exclude the possibility that al-Fārābī may also have been familiar with Arabic excerpts of Syrianus' *Metaphysics* commentary.

2.6.3. *Conclusion*

The previous analysis offered a re-interpretation of the nature and role of the separate intellects and stressed the close interplay between the concepts of intellection and causation in al-Fārābī's metaphysics. It showed beyond doubt that al-Fārābī's cosmology and metaphysics are to a certain extent genuinely Neoplatonic. More specifically, they are indebted to Proclus and possibly his master Syrianus, some of whose writings were translated in Arabic. It is not so much the concept of emanation that indicates al-Fārābī's allegiance to some fundamental aspects of late antique Neoplatonic metaphysics, since this concept has been vaguely described in the secondary literature with respect to al-Fārābī's works and does not possess a meaning distinct and different from his general theory of causality. Rather, it is the other points discussed above with regard to causation and intellection—especially the interrelatedness of these two concepts in his metaphysics—which point to this conclusion. Although it has been suggested that al-Fārābī and Ibn Sīnā were not cognizant of or did not use *Maḥḍ al-khayr*, the foregoing analysis strengthens Maróth's hypothesis as well as more recent claims that this work represents a key element in the elaboration of al-Fārābī's metaphysics and celestial noetics, and, through al-Fārābī's works, of Ibn Sīnā's as well.[245]

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[244] Syrianus (2006, 106,32–107,2).

[245] D'Ancona and Taylor (2003, 637) minimized the impact of the *Proclus arabus* on *falsafah*, but recent contributions building on Maróth (1994) are slowly changing this view with respect to al-Fārābī's and Ibn Sīnā's philosophies: see Daiber (2004), Janos (2010a), and Vallat ("Al-Farabi's arguments for the Eternity of the World,"

The foregoing allows us to re-assess al-Fārābī's relation to late antique philosophy and to the contemporary Islamic Weltanschauung in which he lived. In contrast to M. Mahdi, F. Zimmermann, and others, who believe that it was al-Fārābī's aim to establish an 'Islamic philosophy,' I argued that al-Fārābī's cosmology and metaphysics as articulated in his late works are in many ways closer to late antique Neoplatonic philosophy—both to the Ammonian tradition of Alexandrian Neoplatonism and to the Athenian School of Proclus and Syrianus—than to the prevalent 'Islamic' cosmological models of his time.[246] Indeed, al-Fārābī shows little if no concern in his mature works to defend the orthodox religious position on divine creation, construed in the sense of there being a single Demiurge or Creator-God responsible

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forthcoming); cf. also D'Ancona (2000). This conclusion is also supported by Zimmermann's (1986, 178) remark that al-Fārābī's quotations from *Theology of Aristotle* in *Jamʿ* rely instead on passages culled from Proclus' *Elements*, as Vallat (2004, 73) also shows. The major doctrinal parallels between al-Fārābī and the *Proclus arabus* highlighted in the previous analysis are also strengthened by terminological similarities, such as the common use of the term *al-thawānī*, which means "secondary intellects" in *Maḥḍ al-khayr*, and which al-Fārābī uses to refer to the nine cosmic intellects (see Badawī 1977a, Proposition 9, 13, and passim). For a case study of how a tenth-century Arabic thinker assimilated material from the *Proclus arabus*, see Wakelnig (2006). Hence, the impact of Proclus on Arabic thought is still difficult to delineate with precision, but the evidence for it is gradually accumulating.

[246] Zimmermann (in al-Fārābī 1981a, cx) holds that "al-Farabi neither was nor wanted to be above Islam. His aim in studying philosophy was to create an *Islamic* philosophy." Zimmermann adds in a note: "This aim found magnificent expression in his political philosophy," a statement with which Mahdi would undoubtedly have agreed. This view may be true when applied to al-Fārābī's early works, but it is very debatable when applied to the whole of the Fārābīan corpus. First, and with respect to the metaphysics and cosmology of his later philosophical works, we have seen that al-Fārābī's theories are at odds with the main Islamic tenets on creation and contingency. There is no apparent effort on his part to harmonize his doctrines on causation with contemporary views on divine creation, to such a point that it is unclear whether the concept of divine creation has any real meaning in his metaphysics. But even with respect to al-Fārābī's political thought as expressed in the emanationist works, Zimmermann's statement seems misleading. For al-Fārābī's views are based on the fundamental premise that religions imitate philosophy, and thus that their capacity to convey true knowledge depends on the social and cultural factors existing at a particular time and on the level of dialectical sophistication reached by the religious community of that time. In that sense, religions and philosophy have a relative, not essential, connection, a view which finds further support in al-Fārābī's conception of history and the gradual development of human knowledge. Hence, if al-Fārābī focuses on Islam in his 'political' works, it is primarily because Islam happened to be the main religious paradigm during his time and thus offered the best prospects for elaborating an ideal religious society. In fact, Zimmermann himself (cxii) adds later on that "al-Farabi sees individual religions as different expressions of universal truths and never explicitly claims superiority for Islam."

for the origination of the world. This view was not only the norm in most Christian and Muslim theological circles; it was also the position defended by earlier thinkers such as al-Kindī, Saadia Gaon, and al-Fārābī himself in his 'early Baghdad phase.'

But al-Fārābī goes even further: he denies any specificity to the way in which God creates the world and adopts instead a model of eternal causation that is articulated on various different levels and that endows the separate intellects with a complete demiurgic autonomy comparable to that of the First. These separate intellects are not mere intermediaries, but efficient causes of existence in no lesser sense than the First, even though the existence of each one of them is dependent on a higher cause. The special status of the *thawānī* is fully expressed when al-Fārābī describes them as the "divine principles" (*al-mabādiʾ l-ilāhiyyah*) in *Taḥṣīl*, a formula which evokes the pagan polytheistic system of the Greek Neoplatonists.[247] And indeed, since the *thawānī* are both intelligibles and intellective causes, it is tempting to regard them as a synthesis of the intelligible-intellective beings and the lower demiurges of Syrianus' and Proclus' metaphysics. In upholding these views, al-Fārābī may be seen as an heir to some of these thinkers' doctrines, although he creatively adapted and transformed them to elaborate his own metaphysical model. The result is distinct not only from the Arabic Neoplatonic adaptations and the Greek prototypes on which they are based, but also from the kind of metaphysical speculation that had developed in Islam prior to al-Fārābī's life.

Finally, the analysis showed that in most cases it is idle to divide the Fārābīan corpus in 'Aristotelian' and 'Neoplatonic' works. Many texts believed to be 'Aristotelian' develop theories that consist of a subtle combination of Aristotelian and Neoplatonic doctrines, or put differently, they interpret Aristotelian tenets in light of the late antique commentatorial tradition. Accordingly, al-Fārābī's theory of the separate intellects and his corollary theory of final and efficient causality can be identified in varying degrees in works as diverse as *Falsafat Aristūṭālīs*, *Fī l-ʿaql*, and *Taḥṣīl*, not to mention the emanationist treatises, and they therefore overlap the Aristotelian-Neoplatonic dichotomy maintained by Mahdi, Galston, and Druart. Even *Iḥṣāʾ* and probably *Aghrāḍ*, which more likely belong to al-Fārābī's creationist phase, betray the infiltration of Neoplatonic elements. Hence, these works cannot be

[247] Al-Fārābī (1981b, 63).

considered faithful expositions of the Stagirite's doctrine, and they should instead be contextualized in terms of the late antique philosophical tradition that al-Fārābī is drawing on and perpetuating not only in regard to his general approach to philosophy, but to Aristotelian metaphysics specifically. In contrast, one may propose a new division of the Fārābīan corpus between works that convey a theory of eternal final and efficient causation (the synonymous concept of emanationism is subsumed under this category) and works that defend instead the view of the creation and temporal finitude of the world, emphasize the omnipotence of God *qua* Creator, and do not posit this intermediate level of intellective causal beings between the Godhead and the corporeal world.

2.7. *Causation, Compositeness, and the Celestial Substrate*

Having discussed in detail al-Fārābī's concept of celestial substance and his views on causality in previous parts of this book, I will provide additional insight into how both concepts are linked in his cosmology. What metaphysical role does substrate fulfill in this new causal model? The paragraphs below address this question, aiming to further strengthen the idea that al-Fārābī's adoption of substrate was not random or accidental, but rather a conscious departure from the theories he previously held.

One particularity of the eternalist causative model described in the previous sections is that it leads to a different account of how matter comes into existence. Whereas in *Jamʿ* and *Jawābāt* matter is created *ex nihilo* and absolutely by a Creator God, al-Fārābī's later metaphysical treatises depart from this picture on two crucial points. First, matter *per se* or prime matter is relegated to the very bottom of al-Fārābī's ontological hierarchy and thus beyond the direct causative reach of the First. It is described as the "basest of existents," and its main function is to serve as a substrate for all processes of change, such as generation and corruption. On the other hand, al-Fārābī explicitly connects the existence of prime matter with the causation of the celestial beings. As he writes in *Siyāsah*, "a necessary result of the power common to the whole celestial body is the existence of the prime matter common to everything below the heaven."[248] Since the activity of the celestial bodies and Agent Intellect is eternal and continuous, this means by

[248] Al-Fārābī (1964, 55) and McGinnis and Reisman (2007, 96; see also 95).

implication that the existence and receptivity of prime matter is also continuous and eternal, and thus that the processes of generation and corruption are endless. Hence, not only is matter completely detached from the direct power of the First, but it stands as one of the fundamental principles (*mabādiʾ*) of al-Fārābī's new cosmological model.

The second striking feature is the dissociation of the heavenly substance and the principle of matter. In *Jamʿ* and *Jawābāt*, there is no distinction between celestial and sublunary matter, since matter itself is a product of God's absolute creation. Although it is not explicitly articulated, the view upheld in these treatises is that God created the matter of the heavens and of the sublunary world together and 'all at once,' no distinction being made between the two. But in al-Fārābī's late metaphysical treatises, matter is a principle that is restricted to the sublunary world and defined as a direct effect of the heavenly beings, while the heavens themselves are strictly speaking devoid of a material cause. As a result, the heavenly substance is not hylomorphic—or only called so analogically—for al-Fārābī replaces matter with the concept of celestial substrate (*mawḍūʿ*). In that sense, it is striking that al-Fārābī's account of the causation of the orbs does not include a material cause that can be distinguished from the cause of their soul. Rather, these two effects (body and soul) are due to the same cause, i.e., a separate intellect. By thinking the First, each separate intellect causes another intellect to exist; by thinking its own essence, it causes the existence of an orb and its soul. In contrast, Ibn Sīnā mentions three causes: one for the intellect, one for the celestial soul, and a third cause that is responsible for producing the matter (*māddah*) and corporeality of the celestial bodies.[249] The omission of this third material cause is yet another indication that the principle of matter is minimized in al-Fārābī's cosmology.

In spite of this, the heavenly bodies are caused and are therefore not simple substances. The first function of substrate appears clearly in this regard and can be highlighted through a comparison of Alexander's

[249] Ibn Sīnā (1951, 430/174, 1985, 313–314, and 2005, 330,39–331,4). Al-Fārābī's position that the heavenly bodies are composed of different principles and yet that only one cause is posited for their existence was obviously problematic for Ibn Sīnā, who revised his predecessor's model in light of his elaborate theory of causality. The result was that two distinct causes are assigned to the heavenly bodies in Ibn Sīnā's cosmology, one for the soul and another for the matter of the orbs. But his cosmology may nevertheless be problematic in this respect: how can immaterial beings, i.e., the separate intellects, cause material effects?

and al-Fārābī's cosmologies. Although Alexander defines the celestial body as a soul inhering in a substrate, and although there is some ambiguity as to whether this substrate is to be understood as being completely immaterial or as a second type of matter,[250] he is consistent in claiming the absolute simplicity of the heavenly beings. For example, in *Mabādiʾ* one reads: "As for the divine body, since it is simple [*basīṭan*]—because it could not be eternal if it were composite—and its motion is also one and simple, it does not have any nature at all other than the soul."[251] Alexander establishes a direct equation between simplicity of substance and soul: because the celestial bodies are essentially a soul, they are devoid of multiplicity.

Al-Fārābī, in contrast, has a very different view on this issue. According to him, the fact that the heavenly bodies consist of substrate and soul is used to argue *against* their simplicity. Unlike Alexander, al-Fārābī emphasizes the duality of soul and substrate and presents them as the two components of the orbs' substance. He writes: "The substance [*jawhar*] of each one of the heavens [*samāwāt*, i.e., main orbs] is composed [*murakkab*] of two things: a substrate [*mawḍūʿ*] and a soul [*nafs*]."[252] Furthermore, in *Ārāʾ*, al-Fārābī specifies that the celestial body "thinks with an intellect that is not identical with its entire substance." And he adds that "because it [the celestial body] also thinks its substrate which is not intellect, that part of its essence which it thinks is not entirely intellect."[253] This passage shows that the concept of substance is broader than that of intellect. The celestial bodies are primarily defined in terms of their intellects, but they also possess substrates, which are responsible for making the heavenly substance composite. This explains why al-Fārābī mentions the "things" (*ashyāʾ*) and "parts" (*ajzāʾ*) that constitute the heavenly substance.[254]

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[250] This depends on whether one relies on the commentary on *Metaphysics* or on *Quaestiones*. In the latter work, Alexander seems to argue for the existence of a celestial matter that is different from the sublunary matter. See chapter 3, 1.3.1 on substrate (ὑποκείμενον) in the Greek commentatorial tradition.

[251] Alexander (2001, 17–19, 52–53).

[252] Al-Fārābī (1964, 53, my translation): *wa-jawhar kull wāḥid min al-samāwāt murakkab min shayʾayn: min mawḍūʿ wa-min nafs*. The use of the adjective *murakkab* here is noteworthy, because it was standardly employed in physics to signify the composite nature of sublunary bodies. In this case, the term suggests a parallel between the sublunary hylomorphic beings and the celestial bodies, both being composed of a duality of principles.

[253] Al-Fārābī (1985a, 123, translation slightly revised, 1985b, 70).

[254] Al-Fārābī (1964, 53).

Hence, al-Fārābī never describes the heavenly bodies as beings that are simple in substance, in the manner that Alexander does in *Mabādiʾ*. While for Alexander the substrate does not prevent the orbs from being simple bodies, for al-Fārābī it is the main reason why they are composed.

This point could remain a minor interpretive divergence in these thinkers' concept of substrate, but when related to broader issues, such as the question of the eternity and causation of the world, it acquires a new significance. Alexander's cosmology is in many ways like Aristotle's: it describes the heavens as eternal and divine, and although Simplicius ascribes to him the view that the First Unmoved Mover is an efficient cause of the world's existence, no clear articulation of this idea can be found in his extant works.[255] In this respect, Alexander's intention in stressing the simplicity of the celestial bodies probably had little to do with causation or creation as such, but rather aimed to remove these beings as far as possible from the sublunary world and accentuate their divine nature.

Al-Fārābī has an altogether different aim in mind when stressing the composite nature of the orbs. Since each entity of his cosmology is dependent on a higher cause for its existence, all of these existents must somehow be integrated in the causal chain that begins with the First and then continues with the *thawānī*, the celestial bodies, and ends with the sublunary elements and prime matter. According to al-Fārābī, one of the direct consequences of a thing being caused is that it is composite. Either it is itself made of a plurality of things that are united through its cause, as is the case with corporeal existents, or it possesses a degree of complexity in its essence, without however being composite, as is the case of the separate intellects. This compositeness and/or complexity is in turn responsible for the deficiency of these existents. As al-Fārābī writes in *Fuṣūl*,

> anything whose existence comes about by means of combination and composition … is defective in existence [*nāqiṣ al-wujūd*] because of its constitution's needing the things of which it is combined—whether that is a combination of quantity, a combination of matter and form, or any other of the sorts of combinations.[256]

The triangular relation between causality, complexity or compositeness, and deficiency described by al-Fārābī in this passage explains

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[255] Simplicius in his commentary on *Physics*; see *CAG*, vol. 10, 1358,38–1359,3.
[256] Al-Fārābī (2001a, 53 and 1971, 87).

why he has no problem accepting the proposition of the compositeness of the heavenly bodies, and thus why he goes against a well-established Peripatetic tradition that regarded the heavenly bodies as simple entities and aether as a homogeneous substance.[257] Since the celestial bodies are part of the cosmic scheme and are caused by higher beings, they must by the same token be composite (*murakkab*) and therefore deficient. But as we saw previously, al-Fārābī is reluctant to attribute a hylomorphic constitution to the heavens, and hence he must seek the source of their compositeness elsewhere. He defines them instead in terms of the duality of substrate and soul. These two principles fulfill the same function as form and matter, namely, they make the celestial substance composite, although they possess none of the negative attributes of matter, such as potentiality and passivity.

Al-Fārābī's theory of substrate clearly emphasizes the noetic nature of the celestial bodies in a manner reminiscent of the Neoplatonists. Because substrate does not represent a material principle opposed to the psychological nature of the orbs, the celestial bodies acquire an existence that is almost completely intellectual. This particular understanding of celestial substance belongs to al-Fārābī's general strategy of making intellect and soul the main principles of his cosmology, and in this sense it can help us to understand how the celestial beings can coherently be said to be caused by immaterial beings.

The absence of matter (the standard Aristotelian principle of individuation) means that the differentiation of the celestial bodies occurs purely as a result of their intellection and the hierarchy of their objects of thought, not of a decreasing nobleness of their matter. Each orb aspires to imitate its corresponding separate intellect, and it is the hierarchy of the separate intellects that dictates the hierarchy of the celestial bodies. For example, the outermost orb is nobler than the orb of the sun, because it contemplates the first separate intellect, which is closer to the One than the separate intellect corresponding to the orb of the sun.[258] Finally, the substitution of immaterial substrate for matter in the heavenly substance helps to explain why al-Fārābī describes the

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[257] Al-Fārābī states this relation explicitly in *Fī l-ʿaql*, in the context of his discussion of the separate intellects: "it [the separate intellect] has a principle [i.e., a cause], since whatever is divisible has a cause that makes it a substance" (al-Fārābī 1938, 35 and McGinnis and Reisman 2007, 77). For a comparison of al-Fārābī's and Proclus' theories of causality and its relation to perfection, see Wisnovsky (2003b, 109–112).

[258] This hierarchy is clearly expressed by al-Fārābī in *Ārāʾ* (1985a, 114–115 and 1985b, 67).

celestial souls as intellects, and not, as Ibn Sīnā, as "corporeal souls."[259] The main reason for this difference lies in the divergent explanation that both thinkers give concerning the substance of the celestial body, which is truly material for Ibn Sīnā, and merely a composite of non-material substrate and intellect for al-Fārābī.

The concept of substrate also serves to establish a bridge between heavenly and human intellection in the emanationist treatises and *Fī l-ʿaql*. It figures prominently in al-Fārābī's noetics, a subject to which the Second Teacher is known to have dedicated several treatises.[260] In *Fī l-ʿaql*, which provides a detailed examination of the various meanings of the term 'intellect' and the stages of human intellection, al-Fārābī explains that the potential intellect, which is "a certain soul, or a part of a soul, or one of the faculties of the soul," enables human beings to abstract the forms from the material objects they apprehend.[261] This potential intellect is succeeded by the active and acquired intellects, and finally by the separate Agent Intellect, which is also the tenth cosmic intellect that governs the sublunary world and ends the cycle of superlunary causation. What is of particular concern here is the fact that the material intellect is described as being "like a kind of matter" (*shabīhah bi-māddah*) and as being "itself that which is like matter and substrate" *(al-dhāt allatī tushbihu māddatan wa-mawḍūʿan)*[262] for the forms it receives and for the intellects above it, especially the actual intellect, which acts like a form on the potential intellect.[263]

In another passage of *Fī l-ʿaql*, a-Fārābī goes even further and explains that each intellect is like a substrate for the intellect above it and a form for the intellect below it. Even the acquired intellect *(ʿaql mustafād*), the highest intellectual faculty in humans, is like a substrate for the forms it receives (*wa-l-ʿaql al-mustafād shabīh bi-mawḍūʿ*).[264] A similar description of the human intellect occurs in *Ārāʾ*, where al-Fārābī calls each faculty of the soul "matter" for the faculty above it and form for

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[259] Ibn Sīnā describes the celestial soul as "corporeal" (*jismāniyyah*) in *Shifāʾ* (2005, 312,5–6). In Ibn Sīnā's cosmology, the sphere-souls are not properly speaking intellects and do not have pure intellection, due to their material and corporeal dimension. Rather, they are primarily characterized by imagination (*takhayyul*); see Ibn Sīnā (1983–86, 383,14 ff., 387, 5).

[260] Alon (2002, 810–811).

[261] Al-Fārābī (1938, 12) and McGinnis and Reisman (2007, 71).

[262] Al-Fārābī (1938, 13–14, my translation).

[263] For another description of the potential intellect as material intellect, see al-Fārābī (1985a, 198–203, and passim, 1985b, 101 ff.).

[264] Al-Fārābī (1938, 22) and McGinnis and Reisman (2007, 74).

the faculty below it.[265] These passages are all characterized by the use of analogical language, which compares the faculties of the human soul to a substrate or matter for higher faculties.[266] That any part of the human soul may represent a substrate in which higher principles can act recalls the heavenly substrate, which is also acted upon by the higher faculty of the celestial soul, i.e., its purely intellectual part. Substrate is not material strictly speaking, but possesses some of the characteristics of matter, such as receptivity. Both the heavenly bodies and the various intellectual faculties in humans are substrates in their capacity to receive form from a higher agent, and yet they are strictly speaking immaterial.

This parallel in the cosmology and noetics of al-Fārābī is strengthened by the fact that the heavenly bodies possess a rational soul, which, like the human rational soul, is primarily defined by its intellection and its being a source of perfection. This intellectual kinship is emphasized in *Siyāsah* when al-Fārābī writes that "the celestial souls … have only the soul that intellects, which in some sense is congeneric with the rational soul [in humans]."[267] Hence, although human and heavenly souls and intellects are not identical, they share a number of similarities and are defined through a common terminology. Substrate plays an important role in the ontological structure of soul in al-Fārābī's philosophy.

The common terminology, conceptual framework, and analogical approach employed by the Second Teacher in his discussions of human and celestial intellection indicate an overlap between the cosmological and psychological disciplines in al-Fārābī's philosophy.[268] For this

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[265] Al-Fārābī (1985a, 174–175 and 1985b, 92). Apparently, Themistius developed a similar analogy; see Duhem (1913–59, vol. 4, 386, 397).

[266] As we learn from al-Fārābī's (1938, 13–15) discussion, the difference between the potential intellect and other 'regular' material substrates is that the former entirely fuses with the form it receives and becomes indistinguishable from it, whereas the latter only receive forms on their exterior surface, i.e., these material substrates do not fuse completely with their forms in that the material cause and the formal cause remain distinct (e.g., the shape and the matter of a wooden bed). Al-Fārābī's description of the potential intellect is indebted to the Aristotelian notion that thought and object of thought become one in the act of intellection.

[267] Al-Fārābī (1964, 34) and McGinnis and Reisman (2007, 83, translation slightly revised).

[268] The idea that al-Fārābī's psychology and noetics are a bridge between the cosmological and human levels has already been noted by some scholars, including Madkour (1934, 145), Lucchetta (in al-Fārābī 1974), and Hamzah (in al-Fārābī 2001b, 45).

reason, it may be surmised that he derived the concept of substrate from the field of human psychology and subsequently applied it to his cosmology and metaphysics. This concept, which is usually associated with the human intellect, is transferred to the level of the celestial souls, where it fulfills new noetic functions. Al-Fārābī's cosmology thus seems to exploit ideas from human psychology.[269]

However, these scholars have focused chiefly on the Agent Intellect and not on the heavenly souls. Moreover, although my argument agrees with their basic view of an ontological link between the superlunary and sublunary souls, it goes further in positing a conceptual and methodological transfer of human noetic and psychological notions to the cosmic level.

[269] Returning momentarily to the discussion of transfer (*naqlah*) provided in chapter 1, it is likely that al-Fārābī would have considered the term "substrate" a transferred term (*ism manqūl*) from psychology, assuming that this science was elaborated chronologically before cosmology. Interestingly, modern studies have shown that al-Fārābī's noetics, like his cosmology, was influenced to some extent by the work of Alexander of Aphrodisias, on which see Fotinis (in Alexander 1980), Shroeder (1989), and Blumenthal (1996); for the various levels of intellect, see Gilson (1929), Rahman (1958), and Davidson (1992). In spite of Finnegan's thesis (1957) that al-Fārābī was not influenced by Alexander's psychology, there are convincing reasons to think that the opposite is true. Jolivet (1977, 218, note 33) rightly calls for a revision of Finnegan's position, and Geoffroy (2002) reinstates Alexander's *On the Soul* commentary as one of the crucial sources in al-Fārābī's theories of human intellection; cf. the sections on al-Fārābī in Davidson (1992). The above analysis also confirms this. The idea that the potential intellect is a 'material' intellect, which can best be defined as a substrate for forms, finds an exact parallel in the psychological writings of the Greek commentator. As far as we know, Alexander is the first philosopher to have described the potential intellect as a material intellect; see Alexander's commentary on *On the Soul* (1980, 105). Whether al-Fārābī's theory of celestial substrate was inspired by Alexander's writings on noetics and psychology in addition to the already discussed passages of Alexander's commentary on *Metaphysics* is a point worth considering, and, in my view, a likely one. According to Genequand (in Alexander 2001, 6), Alexander was the first to provide a systematic treatment of the celestial souls by applying concepts taken from *On the Soul*, an approach which represents an interesting precedent to that of al-Fārābī. And according to Steinschneider (1869/1966, 117), al-Fārābī composed a commentary on Alexander's *On the Soul*, which would stand as yet another connection between the two thinkers. If that is the case, then Alexander and al-Fārābī's method of studying the celestial bodies would be very similar indeed. However, in spite of these parallels, these two thinkers visibly had different philosophical priorities and aims when addressing the parallels between human and heavenly intellection. For Alexander, it was to stress the divinity and life-power of the celestial bodies in order to better explain their impact on the sublunary world, a view that fits well with his theory of celestial providence. Al-Fārābī, on the other hand, focused chiefly on the problem of celestial matter and substance and its relation to causation, as well as the concept of intellection as a source of perfection. Hence, in this case as well, the use al-Fārābī makes of these psychological theories and the way in which he interweaves them with other metaphysical concepts testify to his creative approach to cosmology.

3. *Strengthening the Developmentalist Hypothesis*

The previous sections dealing with the nature and origin of celestial matter have brought to the fore some major tensions and discrepancies in al-Fārābī's various works, which were interpreted by means of a developmentalist hypothesis. Naturally, as M. Rashed aptly reminds us, these various doctrinal contradictions should not be construed *in themselves* as proofs for an evolution in al-Fārābī's thought.[270] They may instead be due to various authorships or to a corrupt manuscript transmission, which resulted in the attribution of several spurious treatises to al-Fārābī. However, it was argued before that this approach does not take into account the considerable positive evidence pointing to al-Fārābī's authorship of *Jamʿ* and *Jawābāt*. Moreover, it should be said that if the presence of doctrinal contradictions do not stand as proof of an author's intellectual evolution, they by no means infirm such a hypothesis, especially when it is supported by a host of independent hints and indicators. In what follows, I explore these hints and try to weave them into the developmentalist hypothesis, in order to mount a comprehensive case for it. But before I do so, it would seem appropriate to briefly summarize the main alternative interpretations that have been adopted in the last decades in Fārābīan studies, both in order to show where their shortcomings lie and why the developmentalist hypothesis carries the most weight.

Mahdi's thesis was already addressed briefly in chapter 1 with regard to his views on the place and meaning of cosmology in al-Fārābī's emanationist works. Here I will say merely a few words concerning his broader interpretation of al-Fārābī's thought, especially given that some of its fundamental premises have already been criticized by D. Gutas and P. Vallat.[271] According to Mahdi, the Fārābīan corpus can be divided into the "popular works" and the "serious" or "Aristotelian works." In the former, chiefly represented by *Ārāʾ* and *Siyāsah*, al-Fārābī would be

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[270] M. Rashed (2009, 76–78). A developmentalist hypothesis with regard to *Jamʿ* has already been suggested by Endress "(in al-Fārābī 2008, Prefazione, x–xi), whose view Rashed expressly addresses in this section of his article. It is true that Endress does not provide any argument to support his position. Furthermore, it should be noted that Druart (1987a) had already entertained the hypothesis of an evolution in al-Fārābī's philosophy, but rejected it as unconvincing, due to the lack of a solid chronology of his works. For reasons that will appear clearly in the next paragraphs, I believe that both Druart and M. Rashed have underplayed the few vital chronological indicators in our possession.

[271] Gutas (2002, 2003, and 2004b) and Vallat (2004, 85 ff.).

exposing a popular, exoteric doctrine to assuage the religious fervor of his contemporaries. He would be relying on *Neoplatonica arabica* expressly for this purpose, that is, by defining God as a cause responsible for the world's existence. Aware of the non-Aristotelian provenance of this Arabic Neoplatonic corpus, al-Fārābī nonetheless drew from it on particular occasions in order to make his philosophical system more acceptable to the orthodox camp. In contrast, in his "serious works" al-Fārābī would be commenting and elaborating on Aristotle's genuine doctrines in a manner free of any Neoplatonic infiltration. Intertwined with this argument is the idea that al-Fārābī owed little to the history of late antique Neoplatonism and was chiefly influenced by Middle Platonism, as his political theories are supposed to make clear.[272]

In spite of the valuable insight provided by Mahdi's and Druart's interpretations, it is clear today that they are undermined by several shortcomings. First, in attributing to al-Fārābī the conception of a 'pure' or 'authentic' Aristotelianism, and in defining some of his works as an objective account of the Stagirite's doctrine, which would be very much akin to the one endorsed by modern scholarship, these interpretations rely on an ahistorical approach. They do not sufficiently take into account the import of the late antique tradition of philosophical exegesis and the sustained process of adaptation that Aristotle's doctrines experienced in the Eastern Mediterranean cultural sphere during this period. Consequently, some of the key assumptions underlying

[272] See notably Mahdi (in al-Fārābī 2001c, introduction to the 1961 edition, 5–6) and Galston (1977). Although Mahdi's interpretive framework had a lasting influence and was subsequently adopted by many scholars, mention should be made especially of Druart's thesis as articulated in a series of articles on al-Fārābī's metaphysics (1987a and 1992). Building on Mahdi, Druart offered a compelling classification of al-Fārābī's corpus and an elegant interpretation of his philosophical program. According to Druart, al-Fārābī's corpus can be divided into the "Aristotelian works," the "programmatic works," and "original works." In the first, al-Fārābī objectively summarizes Aristotle's philosophical ideas and does not include any Neoplatonic elements. In the "programmatic works," al-Fārābī outlines his metaphysical project, which he intended as the completion of what he perceived to be Aristotle's unfinished metaphysics by providing a detailed account of procession or the beings brought into existence by the First. Finally, in his "original works," al-Fārābī carries out this project by relying on the *Neoplatonica arabica*. Druart's classification rejects Mahdi's dichotomy between exoteric and esoteric works and the political premise it implies, but it accepts Mahdi's division between 'Aristotelian' and 'Neoplatonic' works in al-Fārābī's corpus. It is also based on the premise that al-Fārābī limited Aristotle's investigation of divine matters to Book Lambda of *Metaphysics* and that he was aware of the spurious nature of the *Neoplatonica arabica*, upon which he nevertheless drew extensively to achieve his own metaphysical project.

Mahdi's interpretive paradigm are not tenable. To give but one revealing example, the notion that al-Fārābī adhered in some of his works to Aristotle's tenet of an eternal world whose existence is uncaused, and thus that he conceived of the Aristotelian God solely in terms of final causality is clearly anachronistic, since the late antique interpretations of Aristotle's cosmology bequeathed to al-Fārābī had added to this picture the key theory of efficient causation and the view that God is responsible for the world's continuing existence. This approach neglects the secular tradition of commentaries on Aristotle that flourished in late antiquity and that thoroughly transformed Aristotelian cosmology. As the previous analysis has shown, al-Fārābī articulates a clear account either of creation or efficient causation in all of his works. This and other similar Neoplatonic elaborations shaped al-Fārābī's reading of the Stagirite to such an extent that it becomes difficult to speak of al-Fārābī's 'Aristotelianism' without these important qualifications.

As a corollary, the classification of al-Fārābī's works proposed by these scholars, and especially the dichotomy between 'Aristotelian' and 'Neoplatonic' texts, cannot be accepted in its main lines and without drastic readjustments. Together with recent studies on the subject, the previous analysis articulated in this book has shown that al-Fārābī relied substantially on a cluster of commentaries by Alexander, Themistius, perhaps Simplicius and Syrianus, as well as independent treatises by Proclus, to interpret Aristotle during the various stages of his intellectual career, even in some of his so-called "Aristotelian works," such as *Iḥṣāʾ*, *Falsafat Aristūṭālīs*, and *Fī l-ʿaql*.[273]

Moreover, the claim that Neoplatonic ideas, including emanationism, appears only in his political or emanationist works, i.e., *Ārāʾ* and *Siyāsah*, seems unfounded. It was argued previously, first, that emanationism is not a distinct concept in al-Fārābī's philosophy that can be meaningfully distinguished from efficient and final causation, and second, that one finds a clear exposition of efficient causation in many of the allegedly 'Aristotelian' works. In this light, the classification proposed by Mahdi appears arbitrary, and it is also on these grounds that

[273] The results concerning al-Fārābī's tendency to interpret Aristotle in light of late antique and Neoplatonic texts, even in his summaries of Aristotelian philosophy, are supported by several recent contributions: see for instance Geoffroy (2002) and Vallat (2004, 85 ff.).

one should regard Druart's otherwise compelling interpretation of al-Fārābī's metaphysics with some skepticism.[274]

Given that these interpretive attempts appear ultimately unsatisfactory in light of recent studies and criticism, the developmentalist hypothesis seems a more promising line of inquiry. Besides, there are compelling positive reasons to adopt it beyond this negative fact. This positive evidence can be divided into two main categories: doctrinal and bio-bibliographic or historical. To begin with, we have seen that al-Fārābī holds contradictory views on several fundamental philosophical issues, such as the nature of celestial substance, the separability of form and its relation to intellect, and the question of the creation of the world. Some of these doctrinal contradictions can be found throughout the Fārābīan corpus and are not by any means restricted to one or two works alone, which could be conveniently rejected on grounds of dubious authenticity. This is true especially of the question of celestial substance, for which one can muster conflicting evidence derived from the entire corpus of the Second Teacher, including works that can be securely attributed to al-Fārābī. These contradictions are strengthened by independent reports made by later authors, such as Ibn Rushd and Maimonides. As for the tension between creationism and eternalism, it does not appear in *Jamʿ* alone, but also in *Jawābāt* and *Iḥṣāʾ*, and

[274] There are other problems with Mahdi's approach, which can only be alluded to here. To begin with, one must accept the fundamental assumption concerning the existence of a full-fledged political philosophy in medieval Islam, a view which has been effectively criticized by Gutas (2002). Perhaps even more problematic is the fact that Mahdi's approach construes al-Fārābī's metaphysics and cosmology solely through the lens of political theory, in effect subordinating these disciplines to politics. But Vallat (2004) showed convincingly that al-Fārābī's metaphysics is not subordinated to his politics, but rather that it is his politics that is subordinated to his metaphysics and modeled on it. The present book has further strengthened the view that al-Fārābī's cosmology and metaphysics deserve to be studied in their own right and contextualized within the history of late antique philosophy and that they are not merely derivative of his political theories. Finally, a quick word should be said with regard to the dialectical interpretation championed by Galston in her monograph on al-Fārābī. Galston's thesis (concisely formulated at 1990, 220) is that al-Fārābī had a "masterplan" he intended to realize in his various writings and whose aim was to induce dialectic knowledge in the reader. I must admit that I find it hard to imagine that al-Fārābī could have written entire treatises containing views and ideas that he did not uphold, merely to entice his students to use dialectical reasoning. Moreover, it seems to me that if this had been al-Fārābī's overarching philosophical aim, as Galston argues, then he would have provided the contrasting views within the same works and in a systematic way, and not in different works, in a scattered manner, and during a period of time that presumably stretched over several decades; cf. Vallat (2004, 85 ff.).

perhaps also in an implicit manner in *Radd*. What this means is that al-Fārābī's authorship of all these texts, and not just of *Jamʿ*, would have to be rejected in order to refute the developmentalist hypothesis. But this in turn significantly increases the implausibility of the spuriousness of *Jamʿ*, which does not appear to be an isolated case.

Additional doctrinal evidence supporting a creationist phase in al-Fārābī's philosophy can be gleaned from his logical treatises, which share numerous features with his early creationist works. A quick glance shows that their tenor and style differ considerably from those of the emanationist works. One of their characteristics is their frequent invocation of divine assistance and their praise of God using a specific vocabulary and honorific titles. For instance, in *K. al-ʿibārah* al-Fārābī repeatedly addresses the divinity as "God Most High" (*Allāhu taʿālā*) and "God Almighty" (*Allāhu ʿazza wa-jalla*).[275] In his introductory treatise *Fī mā yanbaghī*, also presumably an early work, one finds a description of God as "the Creator exalted be He" (*al-khāliq taʿālā*).[276]

These statements, which immediately bring to mind the creationist language used in *Jamʿ*, *Jawābāt*, and *Iḥṣāʾ*, find no parallel in the later emanationist treatises, which speak of God exclusively in philosophical terms and refer to him consistently as "the First" or "the First Cause" (*al-awwal*, *al-sabab al-awwal*). But apart from these stylistic peculiarities, these logical works also contain certain doctrines that echo in an intriguing manner the views developed in the early creationist works. In *K. al-ʿibārah*, for instance, al-Fārābī articulates a logical discussion that is unmistakably in support of the theses of God's foreknowledge and of His knowledge of particulars.[277] The author's aim in this passage is to reconcile God's omniscience with the human freedom to act, and his argument revolves around the idea that God's knowledge of a person's acts does not entail the predetermination of these acts. This compatibilist approach rests on the idea that God is omniscient of all the

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[275] Al-Fārābī (1981a, 92) and the corresponding passages in id. (1960b).

[276] Al-Fārābī (1999b, 53).

[277] Al-Fārābī (1981a, 92,27 ff.). Adamson (2006, 179 ff.) provides an interesting discussion of the topic of divine foreknowledge in his study on al-Fārābī's reply to Aristotle's "Sea-Battle argument" in *On Interpretation* 9. However, the conclusions he draws (185–186) with regard to al-Fārābī's position on this issue and its religious implications cannot, in my opinion, be accepted, as they require one to understand the opposite of what al-Fārābī asserts. This whole passage from *K. al-ʿibārah* shares obvious parallels with *Jamʿ* and may be fruitfully compared to its emphasis on the divine knowledge of particulars.

particulars that occur on earth, a view which can easily be compared to the one articulated in *Jamʿ*, but which on the other hand is severely criticized in the later work *Fuṣūl*.[278] The link between *K. al-ʿibārah* and *Jamʿ* is further strengthened by an identical citation made by their author.[279]

Furthermore, as M. Rashed himself noted, al-Fārābī seems to implicitly uphold a creationist position in *K. al-amkinah al-mughliṭah*.[280] In order to avoid the philosophical implications of this passage, which go against his interpretation, Rashed suggests an amendment of the text, which consists in ascribing the key sentence fragment to another author, most likely Ibrāhīm ibn ʿAdī. Apart from the contrived interpretation this requires, it should be noted that the example provided in *K. al-amkinah al-mughliṭah* is not an isolated case. Al-Fārābī, in fact, frequently uses creationist examples in his logical corpus to explain particular points of method. In *K. al-qiyās al-ṣaghīr*, for instance, which according to J. Lameer is a summary of his larger work *K. al-qiyās*, and according to N. Rescher a short commentary on *Prior Analytics*, al-Fārābī relies on creationist examples throughout the work to illustrate his explanations.[281] For instance, he refers to the creation of the world in his discussion of *naqlah*, or analogical transference:

> This [transference] occurs, for example, when one knows by sensation that some corporeal substances, like the animals and similar things, are created [*muḥdathan*], and consequently the intellect transfers [*yanqulu*] the createdness [*al-ḥudūth*] from the animals or plants, and thus judges about the sky and stars that they are [also] created [*muḥdathah*].[282]

Similar examples also occur in this work in order to illustrate the affirmative mode of the conjunctive conditional syllogism, as well as the use of the compound syllogism.[283] In the latter case, al-Fārābī focuses on an argument based on the composition of bodies and

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[278] Al-Fārābī (1971b, Aphorism 86, 89–90).

[279] See al-Fārābī (1981a, 204, notes 3–4). The doctrinal and terminological parallels between *Jamʿ* and some of al-Fārābī's logical works have already been noted by Mallet, who highlights the overlap between *Jamʿ* and *K. al-ʿibārah*, *K. al-jadal*, *Naṣṣ al-tawṭiʾah*; see al-Fārābī (1999e, 160–161, 168, 176).

[280] Al-Fārābī (1985c, vol. 2, 161) and M. Rashed (2009, 74–75).

[281] Rescher (1963, 34–35) and Lameer (1994, 13–20). Parts of the contents of this work in any case overlap with *K. al-qiyās*; see the editions of these treatises in al-Fārābī (1985c, vol. 2).

[282] Al-Fārābī (1985c, vol. 2, 45).

[283] Al-Fārābī (1985c, vol. 2, 82, 88 ff.); see also the translation by Rescher (in al-Fārābī 1963, 74, 85–87).

accidents, which is designed to prove the existence of the Creator and the origination of the world.[284] It occupies the most space in this short treatise and is outlined by al-Fārābī in detail.

At first glance, it would seem that these creationist examples are merely intended to illustrate a particular logical point and therefore cannot be used as evidence indicating al-Fārābī's adherence to creationism.[285] But one may question this view, which seems to rest on the *a priori* notion that since al-Fārābī rejected creation with time in his emanationist works, he necessarily rejected it in his logical works as well. In fact, many hints seem to point to a different conclusion. First and as mentioned above, the wealth of creationist proofs in *K. al-qiyās al-ṣaghīr* is noteworthy and significant, although it is not by any means a feature peculiar to this treatise alone. Al-Fārābī employs them in this case on no fewer than four occasions. What is even more significant is that he employs them to illustrate valid logical ideas, such as conditional syllogisms, analogy or transfer, and compound syllogisms. Since al-Fārābī has nothing reprehensible to say about these techniques, it would be extremely odd indeed if he were using examples whose conclusions he did not endorse to explain these valid logical points. If this were the case, it would defeat the purpose of his logical exposition.

In this connection, al-Fārābī explains at the beginning of the treatise that he will be using examples that are intelligible to the people of his day: "we shall use for the explanation of these canons [*qawānīn*] only examples that are well known to the people of our time [*ahl zamāninā*]."[286] Since al-Fārābī wrote his logical treatises for a philosophical readership—presumably including his own Christian and Muslim disciples—these examples were meant to be intelligible and easily recognizable to this very audience, and not necessarily, as has sometimes been assumed, to an audience of theologians or jurists.[287] There is therefore no reason

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[284] A variant of this argument focusing on the heavens (*samāʾ*) instead of the world (*ʿālam*) also appears in *K. al-qiyās* (al-Fārābī 1985c, vol. 2, 36–37). This argument from composition has been extensively discussed in Davidson (1969 and 1987).

[285] This is the opinion of Davidson (1987, 134–35), for instance, who writes with regard to the argument of the compositeness of bodies: "Alfarabi, a dyed-in-the-wool Aristotelian [!], could not by any means have accepted the conclusion"; and that this argument from accidents is "cited undoubtedly without approval by Alfarabi."

[286] Al-Fārābī (1985c, vol. 2, 68).

[287] Much has been made of the alternative title sometimes attached to this work in the Arabic manuscript tradition: *Kitāb al-mukhtaṣar al-ṣaghīr fī l-manṭiq ʿalā ṭarīq al-mutakallimīn*. But this title, together with the introductory section that precedes the actual treatise, is clearly an addition to the original text inserted by a later scribe.

to suppose that the Second Teacher would have been at odds with this readership or that he did not endorse the examples used in these works. In fact, these creationist examples go hand in hand with the particular style of these logical treatises, all of which point to a creationist perspective similar to the one adopted in *Jamʿ* and *Jawābāt*.

As further evidence for this hypothesis, it is noteworthy that the creationist example based on composition (*taʾlīf*) that appears in *K. al-qiyās* is also discussed in an almost identical form at the very end of *Jawābāt* to illustrate the use of the technique of *tamthīl*.[288] This shows the doctrinal overlap between the creationist treatises, in this case *Jawābāt*, and al-Fārābī's logical works. But even more significant is the fact that *Jawābāt* articulates in section 9 a clear defense of the theses of the absolute creation of the world with time and of its temporal finitude and future destruction. This means that the creationist example used by al-Fārābī in section 43 does not merely possess an illustrative purpose, but is rather an expression of his own cosmogonical position, which corresponds on all points with the ideas expressed in section 9. By further implication, this means that al-Fārābī used these same creationist arguments in *K. al-qiyās* and *K. al-qiyās al-ṣaghīr* not only because they expressed a common cosmogonical view that would have been intelligible to a wide audience during his time, but also because they defended the very creationist position al-Fārābī himself adhered to during this period of his life. In this connection, it is also revealing that al-Ashʿarī in one of his treatises ascribes this proof from composition "to the philosophers [*al-falāsifah*]," which suggests that al-Fārābī was not merely reporting the views of the *mutakallimūn*, but that he and other philosophers, such as al-Kindī and Saadia Gaon, had developed their own version of it.[289] Hence, it appears that there are

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Indeed, al-Fārābī's text proper begins with the break: *qāla Abū Naṣr* (al-Fārābī 1985c, vol. 2, 68,12). As Lameer (1994, 13–20) points out, this work is fundamentally a summary of al-Fārābī's *K. al-qiyās*, and there is in any case much overlap between the two works. Al-Fārābī explicitly states in the opening section of the work (68, 12 ff.) that he regards the contents of the treatise, if not the actual examples, as genuinely Aristotelian. Hence, *K. al-qiyās al-ṣaghīr* is a much more fitting title. Brague's (1996, 94) analysis of this passage and his claim that al-Fārābī's intention in this work is to discuss dialectic and juridical matters is undermined by the foregoing remarks, especially given that he cites from the preface as if it were by al-Fārābī himself.

[288] Al-Fārābī (1992, sec. 43, 349–350).

[289] Al-Ashʿarī (1987, 55, 58) in *Risālah ahl al-thaghr* attributes to "the philosophers [*al-falāsifah*]" the proof based on "substances and accidents [*jawāhir wa-aʿrāḍ*]" intended to establish the existence of God and the creation of the world; see also Gimaret (1990, 220–221). This proof, according to Davidson (1987, 135), is the very

many valid reasons for concluding that al-Fārābī actually endorsed the creationist proofs that he exposes in some of his logical works, including *K. al-qiyās al-ṣaghīr* and *K. al-amkinah al-mughliṭah*.[290]

To sum up, then, one finds the following features in the logical treatises: stylistic idiosyncrasies and laudatory formulas extolling God's glory and even explicit descriptions of God as "the Creator," which are not found in al-Fārābī's mature metaphysical works; several arguments for the creation and contingency of the world, some of which are echoed in other non-logical works by al-Fārābī and even show a remarkable degree of overlap, as in the cases of *Jawābāt*, *K. al-qiyās*, and *K. al-qiyās al-ṣaghīr*; and a clear defense of God's foreknowledge and knowledge of particulars. These points find striking parallels in *Jamʿ*, *Jawābāt*, and/or *Iḥṣāʾ*, but they are on the other hand absent from the emanationist treatises.

In his logical works, al-Fārābī displays a marked concern for the relation between philosophy, logic, and religion. In general, these treatises are characterized by a sensitivity toward the religious implications of philosophical arguments and by a desire to accommodate the orthodox Islamic position on key doctrinal points within a philosophical framework. This general attitude is also echoed in the creationist treatises. *Jamʿ* aims primarily to show the harmony existing between the most famous Greek philosophers, but like these logical works, it also aims to explain why philosophy—and Aristotelian thought in particular—is not contradictory with religion and can in fact benefit

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one exposed at length by al-Fārābī in his *K. al-qiyās al-ṣaghīr*. And as Davidson (1969) also showed, this proof was adopted by many early philosophers writing in Arabic in the ninth and tenth centuries, such as al-Kindī and Saadia Gaon, who was a contemporary of al-Fārābī. This raises the question of why Davidson so promptly dismisses the possibility that al-Fārābī endorsed it.

[290] Finally, and for the sake of comprehensiveness, *K. al-maqūlāt* contains yet another passage in which al-Fārābī exploits the issue of the creation and eternity of the world to illustrate a logical point (1985c, vol. 1, 124,17–21). In this passage, al-Fārābī intends to explicate the law of non-contradiction by supplying examples of various kinds. He explains that the statements "the world is created" and "the world is eternal" are both false if the world does not exist, just as qualities predicated of Zayd are false if Zayd himself as subject does not exist. Immediately after, al-Fārābī reiterates a similar cosmological example, stressing that the assertions "every [or each] world [*kull ʿālam*] is created" and "each world is not created" are either true or false depending on whether the world (posited in each case) actually exists. One cannot infer much about al-Fārābī's personal views on creation from this passage of *K. al-maqūlāt*, except the fact that the Second Teacher cherished cosmogonical examples in his didactic expositions in his early logical works.

religious orthodoxy and practice.[291] Hence, among the commonalities of these logical and creationist works is a concern to elucidate Aristotelian philosophy, to expound on some of its potentially problematic aspects vis-à-vis the Islamic orthodoxy (as seen in the case of God's knowledge or the issue of eternity), and to argue for the genuine complementarity or harmony of both positions. In this connection, al-Fārābī does not hesitate to cite Qur'ānic verses in support of his philosophical explanations in these works. Finally, they display a common concern for the study of language and for the classification of Arabic terms and their philosophical use.[292]

In brief, the style, contents, and overarching aim of these works overlap significantly, and one perceives a common ideological thread that connects them. On these grounds, one may reasonably conclude that the logical treatises mentioned above were most likely written at the same time as al-Fārābī's creationist works and during his 'early Baghdad period,' when he studied under the supervision of the Christian Peripatetic thinkers or associated with their group.[293] These Christian thinkers were well-versed in the *Organon* and also displayed a similar concern for the relation between logic, philosophy, and religion. The points enumerated above, when combined with the comparative analysis of the cosmologies of Mattā ibn Yūnus and al-Fārābī given in an earlier section, indicate convincingly that this Christian

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[291] See al-Fārābī (1999e, sec. 59, 136 ff.). The implication of this passage is not only that religion and philosophy do not differ in their fundamental premises, but also that philosophy can be of use to religion in clarifying key points of doctrine, such as divine omniscience, absolute creation out of nothing, etc. This is also how a later Arabic thinker, Ibn al-Sīd al-Baṭalyūsī (d. 1127 CE), construed *Jamʿ*. He writes (Elamrani-Jamal 1996, 160): "Al-Farabi rapporte que tous les philosophes de la Grèce, Aristote et les autres, pensaient qu'il n'y avait pas de différence entre la philosophie et la Loi religieuse quant au but recherché." Keeping the audience and social context of *Jamʿ* in mind, this message seems primarily intended to the author's contemporary Muslim readers, a view which seems supported by the implicit Qur'ānic references given throughout this passage. Yet the argument is not specifically addressed to Islam and can also apply to other religious communities. In this respect, this treatise should be construed in light of the ideas on the harmony between religion and philosophy prevalent in tenth-century Baghdad, especially in the Christian philosophical circles; see Watt (2007) and Griffith (2007 and 2008).

[292] For a specific example, see the discussion of *tamthīl* in *Jawābāt* (al-Fārābī 1992, 349–350) and *K. al-qiyās* (id. 1985c, vol. 2, 36 ff.); but *Jamʿ* and *Jawābāt* in general contain a wealth of passages dealing with logical points and linguistic issues, which should be connected to the logical treatises.

[293] It should be pointed out that nothing would have prevented al-Fārābī from possessing his own students during this period, as the extent of his involvement with the Christian thinkers cannot be assessed with any precision.

philosopher, and more generally the Christian philosophical milieu of Baghdad, could have played a decisive role in shaping al-Fārābī's approach to philosophy during this period.

In contrast to all of these putative early works, al-Fārābī's late treatises present very different characteristics in terms of both content and philosophical outlook. By the time of their composition, al-Fārābī had clearly moved beyond the framework and perspective he adopted in these earlier works. These treatises abandon the curricular Aristotelianism that was prevalent in Mattā ibn Yūnus' circle and show a higher degree of intellectual maturity and autonomy. They testify to a profound and thorough assimilation of philosophical material derived from late antique sources and particularly the *Proclus arabus*, which is interpreted in a new light and with the aim of elaborating a new cosmological model. Aristotle is not mentioned as an authority in the emanationist works, and full scope is given to al-Fārābī's creative synthetic abilities. While they also display a concern for the function of religion in society, religion is effectively defined as mere imitation of philosophy and becomes secondary. It is culturally and historically relative and fulfills a purely *ad hoc* political role.[294]

Moreover, the style and contents of these works are remarkably free of any of the traditional laudatory formulas one encounters in al-Fārābī's logical works and in his creationist treatises. The highest metaphysical entity is exclusively called the First (*al-awwal*), the First Cause (*al-sabab al-awwal*), and the First Principle (*al-mabdaʾ l-awwal*), not Allāh, and It is discussed in purely philosophical terms.[295] The First is never defined as "the Creator," and the Arabic roots expressing absolute creation (*kh-l-q*, *ḥ-d-th*, *b-d-ʿ*), which appear regularly in the

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[294] In the summary of *Ārāʾ*, which was not written by al-Fārābī himself, but which faithfully conveys his view on the subject, and in *Fuṣūl mabādiʾ ārāʾ* (al-Fārābī 1985a, 38–39 and 1968, 79), al-Fārābī describes the "thing which should be believed to be God [Allāh]," as well as the "existents which should be believed to be the angels." This implies that common religious notions can be applied to the philosophical principles (the First, the separate intellects) that are discussed in these works and that religion merely serves a mimetic and symbolic function aimed at the non-philosophical crowd, an approach which is typical of al-Fārābī's emanationist treatises.

[295] A passage in *Fuṣūl* further illustrates this point. Having identified the First Principle in the context of a metaphysical discussion, al-Fārābī calls it "the divinity" (*al-ilāh*), not Allāh. *Fuṣūl*, like *Ārāʾ* and *Siyāsah*, consistently refers to the supreme metaphysical entity as the "first principle" or the "first cause." One exception appears in Aphorism 87 (al-Fārābī 1971b, 91), where it is described as "*Allāh taʿālā*." But this seems to be a later scribal insertion, as is suggested by the alternative reading in another manuscript, *al-rabb*, and by the fact that these formulas do not have other occurrences in this work and in the metaphysical sections of the emanationist treatises.

earlier works, are deliberately avoided. With regard to the issue at stake, namely, creation, these treatises articulate a complex model of eternal causation that is arranged on different cosmological levels and that endows the separate intellects with autonomous demiurgic powers comparable to those of the First. This idiosyncratic metaphysical model differs on virtually every point from the 'standard' creationist position of the early treatises and would clearly have been unacceptable to most of al-Fārābī's Muslim and Christian contemporaries.

Finally, the desire to reconcile religious tenets with philosophy, while still present, acquires a new form and becomes secondary in these works. Al-Fārābī's main concern is to provide a coherent, structured account of the various ontological principles that underlie the universe, of how these principles relate to one another, and of how human societies and individual human beings can benefit from their study and reach happiness or *eudaimonia* (*saʿādah*). This synthesis of the scientific knowledge of his time is intended to lay the theoretical foundations for a new kind of philosophical curriculum and social education that can help individuals to fully actualize their substance as rational beings. Hence, these treatises differ from the creationist works even with regard to their fundamental motivation and purpose.

In addition to these doctrinal considerations, several bio-bibliographic facts lend additional weight to the developmentalist hypothesis. Indeed, the idea of al-Fārābī's intellectual evolution coheres quite strikingly with the little that is known about his life and career. We know with certainty from the bio-bibliographers as well as from al-Fārābī's own writings that he studied with Christian thinkers during his early Baghdad phase. It is with these thinkers that al-Fārābī read the Aristotelian corpus and developed his commentatorial method. For this reason, it is legitimate to infer that most, if not all, of his commentaries date to this early period.[296] As his understanding of Greek philosophy was filtered through the didactic framework established by these Christian Peripatetics, it is reasonable to surmise that they may have influenced some of al-Fārābī's cosmological ideas as well.[297]

In contrast, the emanationist works bear no or little connection to this Syriac philosophical milieu. *Ārāʾ* can be securely dated to the last

[296] There are of course exceptions. Al-Fārābī is said to have dictated a commentary on *Posterior Analytics* to Ibrāhīm ibn ʿAdī during his stay in Aleppo; see Gutas (1982a, 210).

[297] Although al-Fārābī's early studies with the Christian thinkers of Baghdad represents a crucial piece of biographical information for the developmentalist hypothesis,

decade of al-Fārābī's life, when he left Baghdad for Syria and Egypt in 942 CE.[298] This simple yet crucial chronological fact has been undervalued by critiques of the developmentalist hypothesis, such as T.-A. Druart and M. Rashed. Because of the doctrinal and stylistic parallels with *Ārāʾ*, the works *Siyāsah*, *Fuṣūl*, and *Taḥṣīl*, and possibly *Fī l-ʿaql*, were most likely composed during this late period as well, either shortly before al-Fārābī's departure from Baghdad or during his stay in Egypt and Syria.[299] That some of these treatises can be dated to the very end of the Second Teacher's output definitely supports the idea of an evolution in his thought and coheres with the special cosmological doctrines they articulate. Here at least we seem to have a clear connection or overlap between the biographical and doctrinal data. Hence, what is known with some certainty about the chronology of al-Fārābī's works and the main events of his life seems to fully substantiate the notion of various philosophical stages in his thought.

It is, furthermore, possible that al-Fārābī defended a creationist view in other works that have not survived. One potential hint in this regard is C. Brockelmann's mention in his recension of al-Fārābī's works in *GAL* of a treatise entitled *Risālah fī ḥudūth al-ʿālam*. While one cannot infer the contents of this work from Brockelmann's entry alone, its evocative title nevertheless raises the possibility that it defends a creationist position in a manner similar to *Jamʿ* and *Jawābāt*. Indeed, the term *ḥudūth*, never used by al-Fārābī in his mature metaphysical works, reminds one of a passage of *Jamʿ* where the author uses this term to refer to the world's contingency and creation *ex nihilo*.[300] This intriguing hypothesis should motivate an analysis of this work in the near future.[301]

Finally, one may propose a historical argument in favour of the developmentalist interpretation. This argument hinges on the simple

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further research must be conducted in order to clarify this connection, especially al-Fārābī's potential debt to these thinkers' cosmology. The analysis of Mattā ibn Yūnus' commentary on *Physics* provided in an earlier section is a step in this direction, although it can only yield hypothetical results.

[298] Gutas (1982a, 210).

[299] Dunlop (in al-Fārābī 1961b, 9–17).

[300] Al-Fārābī (1999e, 124–125), where the author broaches the question of the eternity and creation of the world (*qidam al-ʿālam wa-ḥudūthuhū*). Terms from the root *ḥ-d-th* are used throughout this passage (124–129) to express the creation of the world with time and *ex nihilo* and in opposition to the concept of eternity.

[301] Assuming, of course, that the work was not misattributed to al-Fārābī; see *GAL*, I, 235.

fact that al-Fārābī is the first thinker in Arabic intellectual history to defend an eternalist model of universal efficient and final causation based on the concept of separate intellectual beings. Neither al-Kindī nor al-Rāzī, the two most important Arabic philosophers who flourished before al-Fārābī, nor the Jewish thinkers Saadia Gaon and Isaac Israeli, nor as far as we know al-Fārābī's Christian teachers, Ibn Ḥaylān and Mattā ibn Yūnus, explicitly articulated this model of eternal causation in their works.

The implication is that al-Fārābī did not have an immediate philosophical antecedent or model to follow in the Arabic context and therefore that he must have elaborated this theory over a period of time that was probably quite considerable. Put differently, al-Fārābī would first have had to detach and distance himself from the existing cosmological paradigms of his day, i.e., those of al-Kindī, of Abū Bakr al-Rāzī, and of Mattā ibn Yūnus, which he had presumably learned as a young man and to which he initially subscribed. This explains convincingly why al-Fārābī articulates his causative cosmological model in detail only in his final and mature works, some of which can be securely dated to the very end of his life. If this model emerged out of al-Fārābī's protracted study and adaptation of a complex body of philosophical literature, as I am inclined to think, and if this process eventually enabled him to outgrow his formative philosophical education, then it could not have occurred over a short period of time.

4. *Conclusion*

This chapter endeavored to show that al-Fārābī's cosmology should not be regarded as a monolithic system, but rather as an ongoing philosophical effort spanning several decades and marked by different stages of development. By focusing on the concepts of matter, celestial substance, and causation, it outlined a developmentalist hypothesis according to which al-Fārābī's cosmology shifted from a non-eternalist creationist paradigm which combined Philoponian, Arabic Neoplatonic, and Kindīan elements to a new model of eternal causation and celestial substance in his later emanationist treatises, which emerged out of his increasing use and adaptation of Proclean metaphysical ideas.[302]

[302] The idea of an evolution in al-Fārābī's philosophy has rarely been evoked by scholars, but one exception is the view of Street (2004, 536 and 542) with respect to

If this hypothesis is correct, then al-Fārābī's cosmology can be divided into two main periods: a first one corresponding to an 'early Baghdad phase' and another one corresponding to the end of his stay in Baghdad as well as his sojourn in Syria and Egypt, which may be called al-Fārābī's 'late Baghdad and wandering phase.' From an early creationist model which he adopted partly as a result of his contact with the Baghdadi Christian thinkers, especially Mattā ibn Yūnus, and the influence of the Philoponian and Kindīan legacies, al-Fārābī subsequently and gradually elaborated his own cosmological interpretation of the origin of matter and the world by articulating a complex theory of causality and intellection. This model, apparently for the first time in Arabic philosophy, explicitly posits a level of intellectual beings (*ʿuqūl mufāriqah* or *thawānī*) between the First and the corporeal world. Accordingly, *Jamʿ*, *Jawābāt*, *Radd*, *Iḥṣāʾ*, *Fī mā yanbaghī*, and possibly *Aghrāḍ*, as well as many of the logical treatises composed by al-Fārābī, such as *K. al-ʿibārah* and *K. al-qiyās*, would all have been composed during this same period. What these works have in common apart from the doctrinal overlap is a propaedeutic quality either to the study of logic or Aristotelian philosophy, and a clear connection with the Alexandrian school curriculum. In contrast, *Ārāʾ*, *Siyāsah*, *Fuṣūl*, *Taḥṣīl*, and *Fī l-ʿaql* would have been composed toward the end of al-Fārābī's life, with the hypothetical insertion of *Falsafat Aristūṭālīs* as a transitional work, although the evidence in this case is ambiguous. The most mature expression of this new causative model is to be found in *Siyāsah*, which is similar to *Ārāʾ* in many ways, but which also contains certain elaborations (notably with regard to causality) suggesting that it may have been al-Fārābī's last composition. It should be noted that this classification of part of the Fārābīan corpus agrees in many respects with, and would seem to support, the views of past scholars concerning the late dating of the emanationist works.

All in all, one can not only point to substantial doctrinal evidence supporting this shift, but also partially explain why and how it may

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al-Fārābī's logic: "Alfarabi's attitude to Aristotle seems to have become clearer over time, and in consequence his position changes from one work to another," and: "Alfarabi modified his logical doctrines throughout his life." Although the developmentalist hypothesis has not been the object of much scholarly attention in the case of al-Fārābī, it has received serious consideration with respect to other thinkers. Bertolacci (2001, 259) detects "an evolution in Avicenna's knowledge of Aristotle's *Metaphysics*." See also Wisnovsky (2003b, ch. 9 and 14), who argues for a developmentalist account of Avicennan metaphysics, as well as Gutas (2001) with respects to Ibn Sīnā's theory of *ḥads*. See also Adamson (2007a, 188, and ch. 1, passim) for al-Kindī.

have taken place by identifying some of the late antique sources that nourished it and some of the biographical and social factors that triggered it. Some of the key stages in al-Fārābī's philosophical evolution can therefore be convincingly reconstructed. It is this multi-layered and comprehensive explanatory scheme that, in my opinion, makes the developmentalist hypothesis particularly compelling and well worth investigating in more depth.

But additional concluding remarks are in order, given the length of the previous analysis. The study argued that the evidence concerning celestial matter in the Fārābīan corpus points to an evolution in al-Fārābī's theorizing of this issue, which is closely tied to his views on causation and creation. In contrast to his early works, his mature cosmological model presents a completely different explanation of how matter and celestial substance relate to the First. While in *Jamʿ* and *Jawābāt* matter is created by God *ex nihilo*, absolutely, and with time, in *Ārāʾ* and *Siyāsah* it is the separate intellects that are responsible for the eternal causation of the celestial bodies. And it is these celestial bodies that in turn sustain the continuous existence of prime matter and enable the processes of generation and corruption to perpetually occur in the sublunary world. This model is based on a complex articulation of causality. It introduces a level of immaterial, intellectual entities between the First and the material world that are autonomous causes of existence for the lower existents, but which themselves are inscribed in a movement of reversion expressed by the notion of final causality.

At this point, one is in a better position to assess al-Fārābī's interpretation of Aristotelian cosmology and particularly his conception of how matter relates to creation. In his putative early Baghdad phase, al-Fārābī defended an interpretation of Aristotle's aether theory that was chiefly shaped by his philosophical education at the hands of the Christian thinkers and by the influence of Kindīan and Neoplatonic sources, the latter in the form of the *Plotinus arabus* and *Proclus arabus*. One striking feature of this approach is its particular theorization of two central cosmological tenets, aether or the theory of incorruptible celestial matter, and the creation of the world out of nothing and together with time, which remarkably were reconciled in a single and integrated picture. In this respect, al-Fārābī's position might have been considerably influenced by al-Kindī, who had already achieved a similar synthesis in his works and who relied to this end on a variety of philosophical sources, many of which also informed al-Fārābī's early works. In addition, it would seem from the brief analysis I provided on this subject that al-Fārābī's creationist position could have

been anticipated by his teacher Mattā ibn Yūnus, whose surviving writings also display some of the key features characteristic of this model. Yet more evidence is required to substantiate this hypothesis.

Later on in his life, especially as a result of his deeper engagement with the late antique commentaries and Proclus' and possibly Syrianus' theories of intellection and causation, al-Fārābī abandoned this cosmogonical paradigm and articulated a very different cosmological doctrine. This new doctrine is characterized by an elaborate model of eternal causation grounded in the concept of (self-)intellection and by a new definition of the celestial substance. It is remarkable that al-Fārābī's views on celestial matter and its causation seem to have evolved in perfect parallelism, yet in diametrically opposite directions during these stages of philosophical development. The aether-creationist model of his early treatises can be contrasted to the substrate-causative model of the emanationist works. This suggests that al-Fārābī regarded these two issues as being intimately connected and that they evolved side by side in his cosmological reflection.

The analysis also provided a reinterpretation, or rather a reassessment, of the role of the *Neoplatonica arabica* in this intellectual development. First, it was shown that although al-Fārābī already relied on the *Neoplatonica arabica* when composing his creationist works, as is clear from various terminological and conceptual parallels, it does not seem justified to infer on these grounds that the cosmology these works put forth are in any way similar to, or reconcilable with, the one that appears in the late metaphysical treatises, as some scholars have argued. For the use that al-Fārābī makes of these Arabic Neoplatonic sources appears idiosyncratic in both cases. With regard to the creationist treatises, they are construed through a creationist lens and employed to buttress his cosmogonical thesis. In contrast, the material al-Fārābī borrows and adapts from them in his emanationist treatises is integrated in an eternalist scheme and used to articulate a theory of causation and intellection that finds no trace in the early creationist works. Hence, it would seem that al-Fārābī's study of this Neoplatonic corpus, while spread over his entire life, was achieved for different purposes at different times.[303]

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[303] The question of whether this shift was partly triggered by al-Fārābī's reliance on a new recension of texts from the *Proclus arabus*, or whether he developed a new interpretation and way of reading the same texts should be left open for the time being. Suffice it to say that the manuscript history and the diffusion of the various works

Second, the analysis addressed the problem of al-Fārābī's cognizance of the authorship of the *Neoplatonica arabica*. Many scholars have assumed that al-Fārābī was aware throughout his life that *Theology of Aristotle* and *Maḥḍ al-khayr* were not composed by Aristotle and originated in a philosophical milieu distinct from the Peripatetic tradition.[304] We have seen that this view cannot be convincingly upheld with regard to al-Fārābī's creationist or early Baghdad phase. But what about the later metaphysical treatises? Even in this case, I believe that al-Fārābī's understanding of the *Neoplatonica arabica* was in fact murkier than we think. To begin with, not once in his entire corpus does al-Fārābī attribute the texts from *Neoplatonica arabica* to Plotinus or Proclus.[305] This hint is admittedly not decisive, but it is revealing. For why is it that in the emanationist treatises, which rely substantially on Proclean theories, al-Fārābī never mentions Proclus, nor does he consciously inscribe himself in any kind of Neoplatonic tradition—even though he may rightly be defined in many respects as a worthy heir of

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forming the *Neoplatonica arabica* in the early Arabic context is highly complex and poorly understood, especially during the period that goes from the time of al-Kindī, when many of these works were compiled, to the time of al-Fārābī; see Zimmermann (1986). Accordingly, it is plausible that al-Fārābī had access to different parts of this corpus during his creationist or early Baghdad phase and during his late Baghdad phase. For instance, he may in the former case only have had access to certain excerpts or to a particular compilation (al-Kindī's 'metaphysics file'?) that did not emphasize an eternalist framework, and which could therefore be easily accommodated with—and indeed be used to strengthen—a creationist and non-eternalist position. Following this rationale, al-Fārābī would at a later stage have consulted a fuller version of these texts, or different texts, which contained a more comprehensive scheme of eternal causation and which enabled a new interpretation of Aristotelian cosmology in light of Proclean theories of causation and intellection. The previous remarks nevertheless remain hypothetical.

[304] See Mahdi's (in al-Fārābī 2001c, introduction to the 1962 edition), Galston (1977), Druart (1987a), and Butterworth (2001, 122).

[305] In this connection, it is worth recalling that both *Theology of Aristotle* and *Maḥḍ al-khayr* were attributed to Aristotle in the Arabic tradition. The former was widely known in Arabic as *Uthūlūjiyā Arisṭūṭālīs* and opens with the following statement: "The first chapter of the book of Aristotle the philosopher, called in Greek "Theologia," that is, discourse on divinity" (Adamson 2002a, 27). The latter work is mentioned as one of Aristotle's works in the incipit of some manuscripts. This is the case, for instance, with the incipit of the Leiden manuscript, which reads: "In the name of God, the Merciful, the Compassionate. My success is only through God! The Book of Aristotle's Exposition on the Pure Good" (Taylor 1981, 282). Due to his direct involvement in the compilation and revision of *Theology of Aristotle*, it is possible that al-Kindī knew the true Neoplatonic origin of this work, which he nevertheless perceived as a useful complement to Aristotelian metaphysics. As Zimmermann (1986) has shown, however, by al-Fārābī's time the corpus had undergone considerable transformation, so that the same conclusion cannot be made in his case.

Proclean metaphysics? In other words, al-Fārābī never claims an intellectual lineage that connects him with this Greek thinker in contradistinction to the Aristotelian philosophical tradition. If anything, al-Fārābī regards himself as building on Aristotle's philosophical project, which is the foundation of his own approach to metaphysics and cosmology. In that sense, he does not differ from Ibn Sīnā, who, while seeing himself as a more or less faithful exponent of Aristotelian cosmology and metaphysics, also drew generously from the *Proclus arabus*—perhaps via al-Fārābī—when elaborating his theories of intellection and causation.

A telling illustration of this phenomenon focuses on these two philosophers' interpretation of Aristotle's theory of the unmoved movers. Al-Fārābī provides such a compelling and harmonizing interpretation of the nature, activity, and intellection of these unmoved movers by combining Aristotelian and Neoplatonic theories, that there is a strong reason to believe that in his eyes he was merely synthesizing and bringing together the various theories of a single author. This hypothesis is strengthened by the mention of Aristotle's *Metaphysics*, Book Lambda, in his account of the separate intellects and the First—including their role as efficient causes—that appears at the end of *Fī l-ʿaql*.[306] It is also supported by the fact that Ibn Sīnā, who achieved a similar synthesis of Aristotelian and Neoplatonic material and ascribed both final and efficient causation to the separate intellects, believed his cosmological interpretation of the unmoved movers to be fully compatible and aligned with Aristotle's original doctrine.[307]

In any case, the thorny problem of al-Fārābī's conception of the history of Greek Neoplatonism cannot be solved here and calls for additional research. But regardless of the degree of his awareness of this

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[306] Al-Fārābī (1938, 34–36).

[307] Ibn Sīnā (2005, 316,30 ff.). There has been a general tendency in modern scholarship, partly as a reaction to earlier scholarly conceptions on the topic, to argue that the Arabic philosophers, especially al-Kindī, al-Fārābī, and Ibn Sīnā, were aware of the true origin of *Theology of Aristotle* and *Maḥḍ al-khayr*, or at least that these works were not composed by Aristotle. But it should be stressed that the evidence used by these scholars to support this claim is sparse and difficult to interpret and also appears unconvincing when compared to the much more substantial evidence supporting the contrary position. For an overview of this issue with regard to al-Kindī and Ibn Sīnā, see Adamson (2002a and 2008b) and Aouad (1989, 583–586) respectively. As argued throughout this chapter, I believe that this view cannot be convincingly maintained in the case of al-Fārābī. Although the discussion remains open with regard to al-Kindī and Ibn Sīnā, I am inclined to a similar conclusion in their case as well.

philosophical tradition, and from the perspective of modern source analysis, there can be little doubt that his cosmology and metaphysics are in many respects a genuine continuation of Neoplatonism and served as one of the main channels for the diffusion of this intellectual current in later *falsafah*. More specifically, the analysis showed that al-Fārābī was influenced by the Athenian Neoplatonic tradition as embodied in the works of Proclus and his master Syrianus, in addition to the trend of Alexandrian Neoplatonism already discussed by D. Gutas, R. Wisnovsky, A. Bertolacci, and others.

It is chiefly with regard to his theories of causation and intellection that al-Fārābī reveals both the degree of his reliance on these Neoplatonic sources and the creativity of his philosophical approach. He is the first thinker in the history of Arabic thought to provide a compelling eternalist cosmological model grounded in the concepts of efficient and final causation. This model was the fruit of a long and complex philosophical maturation and of a gradual development of his understanding of ancient Greek cosmology. It enabled him to provide a new explanation of the bonds between the various existents of the cosmos, first between the celestial orbs, souls, and intellects, then between the various separate intellects themselves, and, finally, between the First and the *thawānī*. Al-Fārābī's theory of causation is further connected with the key concept of intellection, or more precisely, self-intellection, through which he explains the existence and subsistence of all the superlunary beings and their rational aspiration to reach the highest perfections of their substance. It is through intellection that efficient and final causality are manifested in al-Fārābī's metaphysics, and it is by elaborating on this complex of concepts that he may truly be said to perpetuate a Neoplatonic metaphysical outlook in the early Islamic context.

In this respect, one may venture to conclude that al-Fārābī's views on the activity and nature of the separate intellects indicate that he could not emancipate himself completely from the polytheistic worldview of late antiquity, especially as it was embodied in Proclus' and Syrianus' metaphysics. But then, there is no convincing reason to think that this was al-Fārābī's intention or that his chief motivation was to elaborate an 'Islamic' philosophy, as some scholars have claimed. Much of the evidence points to the contrary. In al-Fārābī's cosmology, the ways in which God and the separate intellects cause their effects are not clearly distinguished. Both God and the separate intellects are defined as efficient and final causes and possess an autonomous power to induce

existence in the beings situated below them. In that sense, al-Fārābī's cosmology is devoid of a true doctrine of divine creation, in the sense usually understood in medieval Islamic intellectual history. His mature theory of causality contrasts with the creationist ideas that were in wide circulation in many Christian and Muslim circles in Baghdad and to which al-Fārābī probably adhered in his early phase.

CHAPTER FOUR

THE APORIA OF CELESTIAL MOTION

1. *The Various Motions of the Heavenly Bodies*

This last chapter will focus on al-Fārābī's views on celestial motion and its underlying causes, a theme which has received little attention in the scholarship on al-Fārābī and *falsafah* in general.[1] Any attempt to construct a viable cosmological system must include an account of how the celestial bodies move through space. The theories of Plato in *Timaeus* and of the author of *Epinomis*,[2] Aristotle in *On the Heavens*, *Metaphysics*, and *Meteorology*, and of Ptolemy in *Almagest* and *Planetary Hypotheses*, as well as the late antique commentaries written on some of these works, presented medieval philosophers and astronomers with a variety of cosmological ideas and with several compelling kinematic models. The popularity of some of these texts, such as *Metaphysics* and *Planetary Hypotheses*, rested partly on their successful synthesis of astronomical theories and physical and/or metaphysical principles and on the fact that they provided a comprehensive picture of the heavens and a clear explanation of the causes of celestial motion.

The reception of some of these seminal texts in the classical Islamic period was enriched and mediated by the commentatorial tradition that flourished in late antiquity. During this time, many interpretations of celestial motion were developed, some of which were basically a reworking of Aristotle's or Plato's theories, while others appeared to present innovative solutions to this problem. Depending on the author, celestial motion could be caused by a natural inclination in the heavenly body, by matter, soul, will, and even, according to Philoponus' original idea, by a force or impetus that God imparted to the universe at the instant of creation. Consequently, these philosophers disagreed profoundly on the causality and purpose of celestial motion, a debate

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[1] See the insight given by Morrison (2007), who focuses primarily on the theological tradition, as well as Saliba (2007, 171–193); for a case study of Ibn Sīnā's views on celestial motion, see Janos (2011).

[2] This dialogue was most likely not composed by Plato, although it is often included in editions of Plato's complete works.

which had various physical and metaphysical ramifications and occupied much space in these commentaries.[3]

While some of these issues continued in the early Arabic context, and while we have an idea of which Greek cosmological sources were translated into Arabic, it is not always easy to trace the textual origin of some of the specific concepts discussed by the *falāsifah* in their works. As we shall see shortly, this problem is acute in the case of al-Fārābī, because he draws on various kinematic concepts that were discussed at length by the commentators, but he rarely if ever acknowledges their authority. At any rate, the previous remarks define Arabic cosmologists as the heirs of a long tradition of debate with regard to heavenly motion. Al-Fārābī and Ibn Sīnā had access not only to the works of Aristotle and Ptolemy, but also to some excerpts of Philoponus' refutation of Aristotelian dynamics, as well as to various fragmentary texts by Alexander, Themistius, Proclus, and possibly Simplicius. In the case of al-Fārābī, one may even surmise that he knew elements of the Syriac cosmological tradition due to his association with Nestorian translators and philosophers.[4]

As may be expected of a *faylasūf* writing in tenth-century Baghdad, that is, during a period of intense astronomical activity, al-Fārābī's theory of motion displays a vivid concern for astronomical facts and aims to achieve a synthesis of astronomical and philosophical ideas. He discusses themes that overlap with the science of mathematical astronomy, such as the general and particular motions of the planets. However, he also examines the physical and metaphysical implications of heavenly motion, such as its causes and effects, the relation between circular motion and the perfection of the heavenly bodies, motion and intellection, and differences in spatial relation as a kind of deficiency. It is the juxtaposition of these various elements derived from a variety

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[3] A *locus classicus* of this debate is Simplicius' commentary on *On the Heavens*, which not only identifies and discusses some of the crucial issues, but also conveys valuable information on various other thinkers, including Ptolemy, Alexander, and Ammonius.

[4] As Hugonnard-Roche (2007, 289–291) notes, Ptolemy and other Greek scientists were already studied by Syriac authors during the sixth, seventh, and eighth centuries. The Syriac cosmological corpus contained works such as *De mundo* and Alexander's *On the Principles of the Cosmos (Mabādiʾ)*, the latter of which was used by al-Fārābī in its Arabic version. It is interesting that some of these works were somehow attributed to Aristotle in the Syriac tradition, although al-Fārābī surely knew the real author of *Mabādiʾ*, since the name of Alexander appears explicitly at the beginning of the Arabic translation.

of philosophical and astronomical sources that makes al-Fārābī's cosmological system a perfect illustration of the cosmopolitanism of medieval Islamic intellectual history.

Considering the richness of this textual background, it is disappointing to realize that al-Fārābī does not devote much space in his extant works to celestial motion. It should be borne in mind, however, that the works in which extensive analyses of this topic were offered, namely, in his commentaries on *On the Heavens* and on *Almagest*, as well as in his treatises *Kitāb al-nujūm* and *Kitāb fī anna ḥarakat al-falak sarmadiyyah*, have not survived.[5] This means that any reconstruction of al-Fārābī's kinematic theories is restricted to the few relevant passages that can be gleaned from his extant works and on a certain amount of conjecture.[6]

Two reasons may be given to account for this fact in addition to the loss of many of al-Fārābī's works. While al-Fārābī surely discussed celestial motion in depth in his commentary on *Almagest*, he might on the other hand have considered that it was not the proper context and aim (*skopós*) of his philosophical treatises to address this issue. As al-Fārābī explains in *Iḥṣā'*, investigation into the variations of the heavenly bodies' movements is one of the main tasks of mathematical astronomy. But as we have seen, al-Fārābī's cosmology extends beyond the astronomical discipline to embrace physics and metaphysics as well. In his metaphysical treatises, al-Fārābī's approach to the cosmos does not privilege an in-depth treatment of celestial motion, because he is more concerned with other cosmological problems, such as substance, existence, and intellection, which fall within the purview of physics and metaphysics. Since the substance and existence of the heavenly orbs are no doubt points of greater interest to al-Fārābī than the question of motion, at least in these treatises, it is understandable that he would have relegated the latter to a secondary place in his philosophical treatises.

The second reason is that al-Fārābī may not have had a completely worked out theory of celestial motion. Indeed, he may have experienced some difficulty in reconciling the various and often

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[5] See Ibn al-Qifṭī (1903, 279–280).

[6] Walzer had already noticed that one of the characteristics of al-Fārābī's cosmology is that it does not provide a detailed and comprehensive account of celestial motion (in al-Fārābī 1985a, 363). While true to some extent, this statement should be qualified in light of the fragmentary nature of the Fārābīan corpus.

contradictory kinematic doctrines of his predecessors, especially those of Aristotle, Ptolemy, and Alexander of Aphrodisias. If al-Fārābī was hesitant regarding this issue, it is understandable that he would have been reluctant to discuss it in detail in his works. In spite of this, *Ārāʾ* in particular contains brief but interesting comments on celestial motion, both with regard to its causes and nature. In addition, relevant information can be found in *Siyāsah*, *Fī l-ʿaql*, and *Mūsīqā*, while *ʿUyūn* and *Taʿlīqāt* are discussed in appendix 1 due to their problematic authorship. In the following paragraphs, I rely on these works to reconstruct al-Fārābī's kinematic model as accurately as possible. Apart from providing a general picture of al-Fārābī's views on this subject, the analysis will pay particular attention to the relation between the separate intellects and the orbs and to how Aristotelian, Neoplatonic, and Ptolemaic theories interact in his account of celestial motion.

According to al-Fārābī, all the heavenly bodies are characterized by circular motion, the most perfect type of motion.[7] To begin with, the ninth, outermost orb, also called the first heaven (*al-samāʾ l-ūlā*) and the first body (*al-jism al-awwal*), possesses a single and regular westward motion that elapses in a day and a night and that marks a complete revolution of the heaven on itself.[8] This 'first' motion is imparted by the ninth orb to all the other orbs that are contained in it, with the result that the heaven as a whole has a common circular movement from east to west.[9] However, these orbs and spheres also have their own

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[7] Al-Fārābī (2001c, 102–103, 1985a, 124–125, and 1985b, 71). I have already discussed the philosophical assumptions underlying such a view in the section on methodology. It is worth reiterating that the philosophical belief in the perfection of the superlunary bodies and the superiority of the circular shape entails that all heavenly motions be circular, despite their differences in velocity and direction.

[8] Al-Fārābī (1985a, 118–119 and 1985b, 69).

[9] Al-Fārābī (1964, 55). The problem of how this outermost orb imparts motion to the other orbs preoccupied the minds of many philosophers and astronomers: is it through direct physical contact, through soul, or through a power that acts at a distance? Whatever the cause, this ninth starless orb was often made responsible for the general westward motion of the entire heavens. This idea, however, was not accepted by everyone and was criticized as early as the ninth century by Muḥammad ibn Mūsā ibn Shākir (d. 873 CE); see Saliba (1994b; 2007, 92–93). Several centuries later, Quṭb al-Dīn al-Shīrāzī elaborated a model consisting of only seven main orbs, while al-Nīsābūrī added another orb for the fixed stars but rejected the outermost starless orb (Morrison 2007, 84–85). Ibn Rushd and the Ikhwān al-Ṣafāʾ also rejected it and regarded the heavens as a single animated being moving with one motion; for insight into this issue, see Ragep (1993, 409). Al-Fārābī for his part uses the term *quwwah* to

particular motions.[10] The orb of the fixed stars shares the motion of the outermost orb and also possesses a second, eastward motion proper to it, the precession. As for the other seven main planetary orbs below the orb of the fixed stars, they also participate in the general westward motion of the ninth orb, but in addition possess other particular easterly motions that distinguish them. It is these particular motions that explain the unique trajectories of the wandering planets in the firmament, namely, Saturn, Jupiter, Mars, Venus, and Mercury, in addition to the sun and moon. It is worth noting that al-Fārābī believes, like Aristotle, that heavenly motion is eternal and constant and gives the measure of time.[11]

This kinematic account is clearly indebted to Ptolemaic astronomy. The idea that the heavens possess two basic kinds of motion—a universal westward motion (*ḥarakat al-kull* or *al-ḥarakat al-kulliyyah* in the Arabic texts) and particular easterly motions—is developed in sections 1.8 and 7.2-3 of *Almagest* and in *Planetary Hypotheses*,[12] and it was subsequently accepted as a fundamental astronomical tenet by most Arabic and Latin authors.[13] But one point deserves more attention. There is some ambiguity in Ptolemy's works as to what causes the universal westward motion. In *Planetary Hypotheses*, Ptolemy describes the heavens as a cosmic animal (*ḥayawān kullī*),[14] which suggests that the universal motion may be regarded as a kind of power shared by all the orbs and animating a single organism. But as G. Saliba pointed out, Ptolemy in the same work posits the existence of a ninth orb in order to account for the precession of the orb of the fixed stars, and it is this

describe the influence of the outermost orb on the other orbs without specifying the source from which this power derives. More will be said about this concept shortly.

[10] Al-Fārābī (1985a, 128–129 and 1985b, 73).

[11] *On the Heavens* 1.9.279a15 and 2.4.287a24-27 and al-Fārābī (1964, 34, 65). The eternity of the celestial bodies' intellection, rather than their motion, is stressed in the first passage of *Siyāsah*, but the two concepts are intricately connected, as the celestial bodies according to al-Fārābī move as a result of the contemplation of higher principles. In this regard, and according to al-Qifṭī (1903, 280), al-Fārābī composed a work entitled *Kitāb fī anna ḥarakat al-falak sarmadiyyah*, which has not survived. The idea that time issues from celestial motion also appears in *Jamʿ* (al-Fārābī 1999e, 128–129), which is otherwise known for its exposition of a creationist view.

[12] Ptolemy (1987, 92) and Morelon (1993, 18–19, 56–57).

[13] Al-Farghānī, for instance, who came from the same region as al-Fārābī, discusses the two heavenly motions in his work entitled *Jawāmiʿ ʿilm al-nujūm wa-uṣūl al-ḥarakāt al-samāwiyyah* (1986, 15 ff. and 45 ff.). This work was quite influential in both the Arabic and Latin worlds and was used as an astronomical handbook for centuries subsequent to the author's death.

[14] Goldstein (1967, 36).

ninth orb which is also presumably responsible for imparting the universal motion to the other orbs.[15] Al-Fārābī, in contrast, never compares the heavens to a single living organism, and he believes that they are made of several distinct and independent units or groups (sing. *jumlah*). It is therefore reasonable to surmise that he made the ninth outermost orb the direct cause of the daily westward motion of the lower orbs. This seems substantiated by his statement in *Siyāsah* that "all [the celestial bodies] are connected with the power [*quwwah*] of the first heaven, which is one, and consequently they all move by virtue of the motion of the first heaven."[16]

Al-Fārābī also follows Ptolemy's view that each planet possesses several motions that are proper to it and define its particular trajectory in the heavens. In *Ārā'*, for example, al-Fārābī states that while the first heaven has only one motion and the orb of the fixed stars has two motions, the third to ninth orbs possess "motions that are numerous and different" (*ḥarakātuhā kathīrah mukhtalifah*). This view also appears in *Siyāsah*, where the celestial bodies are said to revolve around the earth "with many kinds of motions," as well as in a short passage of *Mūsīqā*.[17] In addition to having its own particular motion, each orb and sphere also revolves with a different speed. This is explained by al-Fārābī in two ways. First, he argues that each orb and sphere possesses an "essential" motion and velocity (*lahā fī anfusihā wa-bi-l-dhāt*) that differs from that of the other orbs and spheres and whose speed is fixed and does not change. Hence, the speed of each orb is from the outset unique and remains so for all time. The second factor is the varying positions of the spheres and orbs, which create variations in the speed with which the planets travel around the earth.[18]

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[15] The theory that the heavens move as a cosmic animal possessing several yet synchronic motions and the question of how this theory relates to the ninth orb are discussed in Ragep (1993, vol. 2, 409) and Saliba (1994b, 118–121, and note 19). It is unclear at this stage how Ptolemy conceptualized this issue, as a systematic edition and analysis of *Planetary Hypotheses* is required in order to answer this question.

[16] Al-Fārābī (1964, 55) and McGinnis and Reisman (2007, 96).

[17] Al-Fārābī (1985a, 121 and 1985b, 69); but see more generally al-Fārābī (1985a, 128–131, 1964, 55, and 1960, 102).

[18] This point should be taken as yet another indication of al-Fārābī's adherence to the Ptolemaic model, for there can be little doubt that the Second Teacher is here implicitly referring to the eccentric and epicyclic devices, whose positions vis-à-vis the earth are constantly changing due to the fact that they do not have the earth as their center. This means that the planets are sometimes closer to the earth, at other times farther away, depending on the position of the eccentrics and epicycles, and thus that from the viewpoint of a human observer the speed with which they revolve around the earth also appears to change.

Al-Fārābī's recognition of a variety of planetary motions, each possessing its own qualities and velocity, is a key feature of his cosmology as well as of other ancient and medieval models that rely extensively on Ptolemaic astronomy. In the larger context of his natural philosophy, it helps to explain his view of how the influences coming from the heavens can be responsible for causing the diversity of the sublunary existents. According to al-Fārābī, the plurality of causes coming from the heavens leads to a plurality of effects in the sublunary world. With regard to ontology, the changing relations between the velocities and positions of the planets and orbs are the only accidents that affect the heavenly bodies and make them "the first of the deficient existents," although it is an insignificant accident that does not pertain to their inner substance.

It should also be stressed that the thesis of multiple planetary motions raised a host of issues for medieval thinkers interested in clarifying the underlying causes of these phenomena. The reason for this is that a single cause was rightly deemed insufficient to account for this multiplicity, and so a multi-layered account identifying various levels of causes had to be elaborated. Al-Fārābī's cosmology is a case in point. Although he is straightforwardly following Ptolemy and other Arabic thinkers in his basic account of the various kinds of heavenly motions, as a physicist and metaphysician he was also interested in the principles behind these phenomena. But the account he provides in his extant works, particularly with respect to the particular planetary motions, is marked by ambiguity. There is no detailed elucidation of how these different motions occur and of the underlying causal process. To say that each celestial body has a motion and velocity that is essential and specific to it does not in any way clarify the nature of its cause. Is it due to soul (*nafs*) or intellect (*ʿaql*), inclination (*mayl*), or matter (*māddah*)? And what is the causal role of the eccentrics and epicycles in this picture? The following section examines these questions and attempts to shed some light on al-Fārābī's views on kinematic causality.

2. *The Causes of Celestial Motion*

2.1. *Nature and Motion: An Impasse*

I already broached the issue of celestial nature in chapter 2 in connection with the bodies and souls of the orbs. Here I wish to provide additional remarks about its relevance to celestial motion, first by providing

a short overview of this question in the late antique context, and second, by focusing on the information contained in al-Fārābī's works.

In the late antique exegetical tradition that developed in an attempt to clarify and explain the works of Plato and Aristotle, there was much disagreement as to what constitutes natural motion in the heavens and how it is caused.[19] Celestial motion was interpreted in light of many different principles such as matter, inclination, soul, or intellect, depending on whether one relied chiefly on Aristotle or Plato and which principle was used to define the nature (φύσις) of the heavens. Furthermore, even within the Aristotelian corpus, *On the Heavens* seemed to posit two alternative models depending on whether one made aether (1.2-4) or soul (2.2) the primary cause of motion. These contradictions were magnified when one compared *On the Heavens* to the evidence contained in *Physics* 8 and *Metaphysics* 12.7-8, according to which the heavenly motion is dependent on an infinite power and requires the postulate of a First Unmoved Mover. But the latter text further complexified the problem by introducing the theory of several unmoved movers responsible for moving the various orbs.

The confusion that emerged as a result of these conflicting views is reflected in the works of the late antique thinkers, who struggled to come up with a conciliatory and harmonizing account of these various trends. Philoponus, for example, held different positions throughout his life and his conception of the nature of the heavens evolved accordingly. As a young man, he considered heavenly motion to be caused by both matter and soul, while later in his career he turned to a more physical-theological account to explain the revolution of the heavens by developing the impetus theory: it is the power invested in matter by God at the moment of creation that is responsible for the motion of the orbs.[20] In contrast, Alexander equated celestial nature with soul, so that he conceived of celestial motion as a psychological process caused by the will and desire of the heavenly souls to imitate the unmoved mover(s). Simplicius in turn disagreed with Alexander, because he

[19] The relation between the celestial nature and other concepts such as soul and inclination in the ancient cosmological context is very intricate, and I can only offer a glimpse here into its history. For more information, see Sambursky (1962), Wildberg (1988), Sorabji (1988), Verrycken (1990b), and Pearson (1999). Sorabji (2005, vol. 2, ch. 1, especially 33–56) conveniently compiles some of the most relevant excerpts from the primary sources.

[20] See Wildberg (1988, 240 ff.) and Pearson (1999).

regarded nature chiefly as a potentiality to undergo change, not to cause it, and he therefore posited a distinction between nature and soul, arguing that the heavenly bodies move as a result of their soul acting *through* their nature.[21]

The previous remarks show the semantic flexibility of the concept of 'nature' in an ancient cosmological setting and the diversity of opinions held by the commentators on the question of what constitutes natural motion in the heavens.[22] It is possible that this lack of uniformity in the commentatorial tradition impacted negatively on al-Fārābī, who does not define celestial nature in an adequate manner in his personal treatises. In spite of this, however, a few important points can be extracted from his works.

To begin with, al-Fārābī does not endow the celestial substance or nature with a particular inclination for circular motion in works conveying his own doctrines. Whenever he does so, it is always in the context of his explanatory or apologetic works on Aristotelian philosophy. Perhaps the most striking example occurs in *Radd*—a treatise aiming to defend Aristotle's theory of the elements and aether—when the Second Teacher states that "he [Aristotle] begins with that part of the world which, by its nature [*bi-ṭabīʿatihī*], moves with a circular movement."[23] Another similar statement appears in *Falsafat Arisṭūṭālīs*, where al-Fārābī explains that "he [Aristotle] investigated whether or not the principles that move the *bodies moving in a circular motion by nature* [*li-l-ajsām allatī tataḥarraku ḥarakah mustadīrah bi-l-ṭabʿ*] are themselves bodies or whether they are nonbodily essences that are, however, in a material and a body."[24] Al-Fārābī was thus aware that Aristotle had endowed the celestial element with a propensity for circular motion and that this circular motion was either "according to nature" (*bi-l-ṭabʿ*) or "according to its nature" (*bi-ṭabīʿatihī*), i.e., to the special nature of the heavens. But quite surprisingly at first glance, the Second Teacher seems to have completely neglected the correlation

[21] Both views are exposed in Simplicius' *On the Heavens* commentary (2004a, 380,1,30 ff.).

[22] For this reason, Wolfson's (1929, 77–78) distinction between two types of accounts of celestial motion in the medieval period, one based on soul, the other based on nature, appears artificial due to the equivocity of the term 'nature' and the overlapping of these two concepts.

[23] Mahdi (1967, 253–254).

[24] Al-Fārābī (2001c, 102–103, my emphasis).

Aristotle establishes between the special celestial matter and circular motion.

This appears clearly if we turn to al-Fārābī's mature cosmological treatises. The evidence they contain is quite limited, yet worth discussing. Al-Fārābī states in *Ārāʾ* that the heavenly bodies move "by their nature" (*bi-ṭabīʿatihā*) and that they "have a common nature [*ṭabīʿah mushtarakah*] through which, by virtue of the motion of the first body, they all come to move round in a circular motion in one day and one night, as a result of the motion of the first body among them." And he adds shortly after: "For this movement of what is below the first heaven is not brought about by compulsion [*qasran*], since it is impossible that there should be anything in the heaven which takes place by compulsion."[25] These passages explicitly connect the celestial nature (*ṭabīʿah*) with the circular motion of the orbs. But in what sense are we to understand this concept of nature?

First, it is noteworthy that al-Fārābī adopts in these passages a well-known ancient Greek cosmological tenet according to which celestial motion is essentially harmonious and natural and devoid of compulsion or contrition. Al-Fārābī sets in opposition motion 'by nature' and motion 'by compulsion,' limiting the latter concept to the rectilinear movements of sublunary bodies. This basic opposition harkens back to Aristotle's theory of the elements as exposed in *On the Heavens* 1.2-4, according to which the four primary elements all possess a natural place which they reach through rectilinear motions (such as the downward motion of earth and the upward motion of fire). As a result, these elements cannot move in the opposite direction except through compulsion. Since the heavens do not possess a rectilinear motion and a natural place, Aristotle concludes *On the Heavens* 1.2 by positing the existence of a fifth element, aether, which possesses an inherent circular motion.

Second, since al-Fārābī makes the celestial souls the proximate movers of the orbs and planets, it is likely that he agreed with Alexander in construing celestial nature psychologically, that is, as being reducible to the celestial souls. Support for this hypothesis also comes from Ibn Sīnā's cosmology, which is in many ways modelled on that of al-Fārābī, and which establishes a clear link between the celestial souls and a

[25] Al-Fārābī (1985a, 105, 132–133, translation revised, and 1985b, 62, 75).

special celestial nature (*ṭabīʿah*), although it does not conflate these two concepts in the manner that Alexander would have. In *Metaphysics* of *Shifāʾ*, Ibn Sīnā explains that this celestial nature is "an emanation from a soul [*ṭabīʿatahū fayḍ ʿan nafs*] that is renewed in accordance with the soul's act of acquiring representation."[26] On this view, the celestial nature is more closely connected with the celestial soul, from which it ultimately derives, than with the inherent circular propensity of aether or celestial matter. The evidence suggests that al-Fārābī envisaged celestial nature in a similar way, since his cosmology emphasizes the importance of soul and downplays or even neglects celestial matter. However, the passage from *Ārāʾ* quoted above that mentions the "common nature" of the orbs is somewhat difficult to reconcile with the concept of soul, for al-Fārābī believes in the existence of several distinct celestial souls, and not of one single soul pervading the entire heavens. Exactly how this statement should be interpreted in the context of al-Fārābī's cosmology is unclear.

Finally, it is worth pointing out that *ṭabīʿah* also had a more specific astronomical meaning, which rests on the idea of a simple, regular motion from east to west shared by all the orbs. Indeed, Ptolemy in *Planetary Hypotheses* explains the regularity and harmony of the orbs' motions by referring to their *ṭabīʿah*.[27] Al-Fārābī's mention in *Ārāʾ* of a "common nature" (*ṭabīʿah mushtarakah*) of the orbs through which they follow the motion of the outermost orb may definitely be construed in this sense and could be based directly on *Hypotheses*. But here too we are faced with the problem of understanding what Ptolemy means by nature, since he accepts the existence of aether and in addition posits planetary souls.[28] Since *ṭabīʿah* is defined primarily by the regularity of the celestial motions in an astronomical context regardless of whether soul is taken to be a cause of motion, and since Ptolemy mentions aether several times in *Planetary Hypotheses*, sometimes even explicitly in connection with the nature of the orbs,[29] it is reasonable to conclude that he made aether at least partly responsible for this

[26] Ibn Sīnā (2005, 308,33–35).

[27] Goldstein (1967, 36). As Ragep (1995, vol. 2, 380) and Pingree and Haq *EI²* explain, regularity or homogeneity appears to have been the most important criterion in the astronomical tradition for ascribing natural motion to the celestial bodies.

[28] For a discussion of Ptolemy's theory of celestial motion, see Sambursky (1962, 133 ff.) and Murschel (1995).

[29] Goldstein (1967, 36,6–7).

natural celestial motion. As for al-Fārābī, he says nothing about a special heavenly element. Yet his use of the concept of nature in this particular passage of *Ārāʾ* could stem from the astronomical tradition and could have been intended simply to point to the harmonious, regular motion shared by the orbs, regardless of its ultimate principle. Al-Fārābī's mention of nature in connection with celestial motion may also serve to emphasize the notion of cosmic harmony and order: every part of the universe fulfills the particular role that is assigned to it by nature and according to the order of being; nothing occurs through compulsion or randomness.

It is worth raising the question here of whether al-Fārābī may, like Ibn Sīnā, have distinguished between motion "by nature" (*bi-l-ṭabʿ*) and "natural motion" (*ḥarakah ṭabīʿiyyah*). Ibn Sīnā sometimes opposes the psychological motion of the orbs to the natural motion of sublunary bodies, explaining that the revolution of the heavens cannot be due to a nature (*ṭabīʿah*) or be defined as natural (*ṭabīʿī*). According to this thinker, the celestial motion may be said to be "by nature" (*bi-l-ṭabʿ*) in the sense that it is not brought about by compulsion.[30] Al-Fārābī, in contrast to Ibn Sīnā, uses both expressions *bi-l-ṭabīʿah* and *bi-l-ṭabʿ* synonymously with regard to the heavens—the latter term appears once in *Falsafat Arisṭūṭālīs* to describe the doctrine of the Stagirite[31]—and in a way that allows us to connect them with the "common [celestial] nature" (*ṭabīʿah mushtarakah*) he speaks of in another passage.[32] Al-Fārābī therefore uses the terms *ṭabīʿah* and *ṭabīʿī* indiscriminately in both a superlunary and sublunary context, even though the "common nature" he ascribes to the heavens clearly possesses its own characteristics. True, in *Ithbāt*, a work ascribed to the Second Teacher, the author argues that celestial motion is "not natural" (*ghayr ṭabīʿiyyah*), a view which is reiterated in *Daʿāwā* when the author writes that "the motion of the celestial body is spiritual, not natural" (*wa-inna ḥarakatahū*

[30] See Ibn Sīnā (2005, 307–308 and especially 308,13–20). But Ibn Sīnā's position is somewhat ambiguous, since in other instances he seems intent on ascribing some kind of nature (*ṭabīʿah*) to the heavens; see Ibn Sīnā (1983–86, 382, 383; cf. id. 2005, 308,18–20, 25 ff.) and Hasnawi (1984). The point seems to be that the principle endowing the celestial bodies with motion is not natural, but that motion itself when realized in the celestial bodies may be conceived of as something natural. For a discussion of this distinction in al-Ṭūsī's astronomy, see Ragep (1993, vol. 2, 380).

[31] Al-Fārābī (1961a, 97,6).

[32] The term *ṭabʿ* is used repeatedly by al-Fārābī in other contexts in *Ārāʾ*; see Walzer (in al-Fārābī 1985a, 393–394).

nafsāniyyah lā ṭabīʿiyyah).[33] But there is a strong possibility that these two works may have been composed in the Ibn Sīnā circle.[34]

Overall, then, al-Fārābī's mention of a celestial nature is of very little help to understand the causes of celestial motion.[35] The only thing that may be established with some certainty is that al-Fārābī believes heavenly motion takes place "by nature" as opposed to "by compulsion." But it is unfortunately not possible to further determine what meaning this term conveys and what causal efficacy it possesses, due to al-Fārābī's laconic style and the absence of more substantial evidence in his works.

2.2. *Quwwah*

Quwwah is another key concept that requires clarification. To my knowledge, it is mentioned only twice in al-Fārābī's corpus in connection with the motion of the celestial bodies: in *K. al-ʿibārah* and in *Siyāsah*.[36] Both occurrences will be examined below.

Like the concept of nature (φύσις), power (δύναμις in Greek) has a rich history in ancient philosophy. Plato mentions the "powers" of the celestial bodies on numerous occasions in his works, as does the author of the *Epinomis*.[37] In Ptolemy's *Planetary Hypotheses*, which may have been influenced by the Platonic tradition in this regard, power (*quwwah* in the Arabic translation) refers to the planets' ability to induce its own circular motion. According to A. Murschel, this power should be associated with the psychological faculty of the planets, although it does not necessarily involve any intellectual activity.[38] *Quwwah* is also a central philosophical concept in the Arabic translations of Aristotle,

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[33] Al-Fārābī (1999d, 6 and 1930, 7). The latter text, in particular, shows many similarities with Ibn Sīnā's doctrine and should probably be attributed to his circle.

[34] Indeed, these two works contrast natural motion to psychological motion in a way reminiscent of Ibn Sīnā's argumentation and which finds no parallel in al-Fārābī's extant works; see Ibn Sīnā (2005, 307 ff.).

[35] If we accept the above hypothesis that al-Fārābī's use of *ṭabīʿah* in the *Ārāʾ* passage may be informed just as much by the astronomical tradition as by the philosophical one, then it is not surprising that it says nothing about the ultimate causes of celestial motion; on causality in the *hayʾah* literature, see Ragep (1995, vol. 1, 45–46, and vol. 2, 380).

[36] Al-Fārābī (1981a, 94,10, 1960b, and 1964, 55). Al-Fārābī also uses *quwwah* frequently in his discussion of the human soul, where it usually means faculty, as in *al-quwwah al-nāṭiqah*, 'the rational faculty.'

[37] See for instance *Timaeus* 38D and *Epinomis* 986B-C.

[38] Murschel (1995, 38–39).

where it may be translated as 'potentiality,' 'faculty,' or 'power' depending on the context. More specifically, however, *quwwah* appears in Aristotle's discussion of the Unmoved Mover in *Physics* and *Metaphysics*, where it serves to designate the continuous power and actuality of God.[39] Finally, it is also used by the author of *Maḥḍ al-khayr* in connection with the various activities of soul, and in *Theology of Aristotle* to signify the power emanated from the soul onto the world of nature.[40] Although al-Fārābī may have derived the notion of *quwwah* from any of these sources, the cosmological context in which he uses this term establishes a connection with *Physics* and *Metaphysics* on the one hand and with Ptolemy's *Planetary Hypotheses* on the other.

In al-Fārābī's cosmology, *quwwah* usually does not mean potentiality, but rather power, since the celestial bodies are always in motion and in a state of actuality.[41] However, in the case of celestial motion, the heavenly bodies may be said to possess both a power and potentiality for only one type of activity, namely, circular motion.[42] Unlike sublunary bodies, whose *quwwah* embraces the opposites of action and inaction, the heavenly bodies' power is only for action. In *K. al-ʿibārah*, al-Fārābī writes: "There is another kind of power [*quwwah*], namely, readiness for one of the opposites alone, such as the power of circular motion, which is in the heavenly bodies."[43] As al-Tahānawī's *Iṣṭilāḥāt al-ʿulūm al-islāmiyyah* reveals, this meaning of *quwwah* as power and its association with the perpetual circular motion of the heavens were widespread in the Arabic cosmological tradition.[44]

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[39] Endress (2002, 23). The relevant passages in Aristotle are: *Physics* 3.5, 8.6 and 8.10, and *Metaphysics* 12.7.1073a3-11.

[40] Badawī (1977b, 38 ff.), Lewis (1959, 65 ff.), and D'Ancona (2003, 250).

[41] That the celestial bodies are free of potentiality in the sense of possibility is made clear when al-Fārābī, referring to Aristotle's view, writes: "as regards agents, possibility is in such agents as—unlike the heavenly bodies, which perform an action of permanent motion—are not in action permanently" (1981a, 93,24). It would seem, then, that al-Fārābī distinguishes between a possibility of action, which the heavenly bodies lack, and a possibility of existence, which the heavenly bodies have in virtue of their causes, i.e., the separate intellects.

[42] Ibn Sīnā also discusses *quwwah* in his cosmology (2005, Book 9, ch. 2, passim). In Ibn Sīnā's system of celestial kinematics, *quwwah* is connected with inclination (*mayl*) and intention (*maʿnā*). "Power," says Ibn Sīnā, "imparts motion only through the mediation of inclination. Inclination is the idea [*maʿnā*] sensed in the mobile body" (2005, 308,20–21). See Janos (2011) for a more detailed discussion of this topic.

[43] Al-Fārābī (1981a, 94,10 and 1960b).

[44] See the article by de Boer in *EI*[2]. Al-Tahānawī gives an almost identical description of how *quwwah* relates to celestial motion, but in addition he calls it the "origin of an act" (*mabdaʾ l-fiʿl*) and a "cause" (*sabab*).

But what exactly is the function of *quwwah* in al-Fārābī's kinematics? In order to answer this question, we must look at the other instance in which this term appears. In *Siyāsah* one reads:

> All [the celestial bodies] are connected with the power [*quwwah*] of the first heaven, which is one, and consequently they all move by virtue of the motion of the first heaven. They have other powers [*quwan*] by virtue of which they are distinct from one another and by virtue of which their motions differ.[45]

The first occurrence of the term *quwwah* in this passage expresses a 'force' or 'influence' that is transmitted by the first, outermost orb to the other orbs below it. This power need not be construed as a psychological one and may simply consist of a mechanical force transmitted as a result of the proximity of the orbs. Indeed, all the heavenly orbs are contained in the outermost orb, whose convex surface constitutes the physical limit of the universe and whose motion is communicated to all the other bodies within it, except the earth. The problem, however, is that, as we shall see shortly, al-Fārābī considers soul the main principle of celestial motion, so that there is the strong possibility that *quwwah* should be interpreted in connection with soul. It is probably in this manner that the second reference to the *quwan* of the celestial bodies should be construed, for it is more difficult in this case to explain these other powers in purely mechanical terms, since they are specific to each orb and do not influence the other orbs around them. But even the first occurrence of *quwwah* can be reconciled with a psychological account, in the sense that the motive power of the outermost orb could issue from its soul, and this power then be transmitted through its rotating body.

The connection between soul and power in a celestial context will be discussed in the forthcoming section on the principles of motion. Suffice it to say here that it was not an innovation by al-Fārābī and can be traced to the Arabic version of *Planetary Hypotheses*, which mentions the *quwwah* of the planets on several occasions.[46] Ptolemy defines it as a vital force or psychological faculty or power associated with the celestial bodies, which are described as animated, living beings. As A. Murschel writes, "Ptolemy also claims that the celestial bodies maintain a faculty (*quwwa*) which may be compared to the human

[45] Al-Fārābī (1964, 55) and McGinnis and Reisman (2007, 96).
[46] Ptolemy (1987, 92, 98–99, 103).

faculties of vision and intelligence, but his use of such a comparison does not imply that he believed that the planets have the ability to see or perform some mental function."[47] As we shall see shortly, al-Fārābī and Ibn Sīnā likely interpreted this power in connection with the contemplative activity of soul, an interpretation that would have seemed all the more natural to them since Ptolemy himself asserts the ensoulment of the orbs.[48] Unfortunately, al-Fārābī does not provide additional insight into this topic, and so it is unclear whether *quwwah* should be interpreted ultimately as a power emanating from the celestial soul specifically or as a disposition in the celestial body as a whole. Again in this case, we are faced with a dearth of evidence that prevents any decisive conclusions.

2.3. *Intellection as a Cause of Motion*

2.3.1. *Ārāʾ, Siyāsah, and Fī l-ʿaql*

Given that al-Fārābī does not stress the correlation between celestial matter and motion, it is not surprising that he turned to other principles to explain the phenomena of the planetary motions. When al-Fārābī writes that the orbs move "by their nature," he is not thinking of a material principle or a special heavenly element that would possess an inherent circular motion, but rather of more fundamental principles, namely, soul and intellect.

In contradistinction to the correlation made in *On the Heavens* between aether and circular motion, Plato's *Laws* and *Timaeus*, the *Epinomis*, and Aristotle's *Metaphysics* (I am assuming here that the orbs of Book Lambda 7 and 8 are ensouled) develop a different interpretation of celestial kinematics that focuses on soul. This psychological theory, which was later adopted and developed by other thinkers such as Alexander, Themistius, Simplicius, and Proclus, and which also influenced Ptolemy's *Planetary Hypotheses*, emphasizes the role of the heavenly souls as movers of the orbs. In the process of discussing these issues, however, these authors elaborated on more specific concepts, such as desire, will, intellection, and power, which they weaved into

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[47] Murschel (1995, 38).

[48] Ptolemy holds that "the planets are ensouled (*mutanaffisa*) and are moved with a voluntary motion" (Murschel 1995, 39). What kind of psychological faculties the orbs have according to Ptolemy is nevertheless unclear and requires more detailed research.

their accounts and which often represented substantial departures from the foundational texts of Plato and Aristotle.

The few relevant passages that can be gleaned from al-Fārābī's works show that he definitely belongs to this 'psychological' trend, which makes soul the main cause of celestial motion. In *Siyāsah*, he writes that the celestial bodies "move in circular fashion by virtue of their [souls]" (*wa-ʿanhā tataḥarraku dawran*).[49] The psychological process that results in motion is not further described by al-Fārābī in this passage, and the reader may wonder at the role that the celestial souls and separate intellects play respectively in this account. It is notable that this is the only piece of evidence in the emanationist works that *explicitly* connects heavenly soul and motion.

Ithbāt—whose authenticity, it should be stressed, is uncertain—provides more information on this topic. This short treatise is designed to provide proofs for the existence of the metaphysical beings. Al-Fārābī begins by discussing the existence of God and the separate intellects, and then lists three proofs for the existence of the celestial souls (*al-nufūs al-samāʾiyyah*), all of them based on motion. The first one argues that natural motion (*al-ḥarakah al-ṭabīʿiyyah*) occurs only when a thing is in a non-natural state and seeks to return to its natural state, which is rest. But rest does not apply to the heavens, whose motion therefore cannot be natural. The second proof affirms that a body seeks a place of rest according to the shortest and most direct path, which is necessarily rectilinear. The heavens, in contrast, always move in circles, thereby showing that they are different in this respect. The third argument opposes the mechanical motion of the natural elements that can never avoid their goal (unless they are impeded) to the free, volitional motion of the heavens. The author concludes by saying that circular motion is "not natural, but arises from soul and choice" (*fa-hiya idhan ghayr ṭabīʿiyyah fa-hiya nafsāniyyah ikhtiyāriyyah*).[50]

It is notable that these proofs are mostly negative. They do not positively show that the celestial souls must exist, but rather infer this from the impossibility of conceiving of celestial motion as a natural phenomenon. The rationale is that if celestial motion is not natural, then it must be psychological. Regardless of the philosophical value of these

[49] Al-Fārābī (1964, 34).

[50] Al-Fārābī (1999d, 6). Again, it should be stressed that this treatise may not be authentic, but further research into its contents is a *desideratum* to settle this point.

arguments, they stress the author's belief in the ensoulment of the orbs and in the spiritual cause of celestial motion and thus should be read in conjunction with al-Fārābī's emanationist works. In addition, it should be stressed that *Ithbāt* is the only text that explicitly mentions the choice (*ikhtiyār*) of the heavenly bodies.

So far I have discussed the role of the celestial souls in motion, but what about the separate intellects? *Fī l-ʿaql* sheds light on this question, although it by no means offers a systematic treatment of it. Toward the end of the treatise, which is primarily devoted to the various definitions of the term 'intellect' (*ʿaql*) formulated by philosophers and theologians, al-Fārābī states the following:

> Every celestial body is set in motion only by a mover [*muḥarrik*] that is neither a body nor in a body in any way. [This mover] is the cause of [the celestial body's] existence [*huwa l-sabab fī wujūdihī*], inasmuch as it is that by virtue of which [the celestial body] is a substance, but its level, in terms of the existence that is [the celestial body's] substance, is the same as that body. The mover of the more perfect of [the celestial bodies] is the more perfect in terms of existence, and the more perfect in terms of existence is the mover of the first heaven.

This passage is valuable because it shows that al-Fārābī adhered to Aristotle's theory of the unmoved movers. Each one of these movers (sing. *muḥarrik*) is immaterial and separate from the orb and responsible for the latter's motion. Al-Fārābī then goes on to identify these movers with the separate intellects (*thawānī*): "Now, since the mover of the first heaven is neither matter nor in matter, it necessarily follows that it is an intellect [*ʿaql*] in its substance."[51] Al-Fārābī's main focus in this entire passage is clearly on noetics and ontology rather than motion *per se*; he expounds on the role the separate intellects play in causing existence, but says little about their being causes of motion. At any rate, the identification of each mover with a separate intellect in this excerpt is crucial, because it represents the only instance in the Fārābīan corpus where al-Fārābī uses the term *muḥarrik* explicitly to describe the separate intellects, even though this equation is implied in his other works. This shows beyond any possible doubt that he perceived his theory of the *thawānī* as an adaptation of, and as being fully compatible with, Aristotle's doctrine of the unmoved movers as exposed in Book Lambda 7 and 8.

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[51] Al-Fārābī (1938, 34) and McGinnis and Reisman (2007, 77).

In contrast to *Fī l-ʿaql*, the description of the relation between the orbs and the separate intellects in *Ārāʾ* and *Siyāsah* is limited to ontology and intellection and does not directly broach the topic of motion. But these works do not by any means contradict *Fī l-ʿaql*, and the information they provide can on the contrary be used to complement it and construct a single and comprehensive cosmological picture. The various elements discussed in these works can be arranged as follows: each celestial body possesses a rational soul (*Ārāʾ* and *Siyāsah*), which enables it to contemplate its separate intellect (*Ārāʾ* and *Siyāsah*). Since the separate intellects are described as movers (*Fī l-ʿaql*), one may conclude that they act as final causes of motion for the orbs by being an eternal object of thought. Furthermore, since the First is an intelligible and an object of contemplation for the celestial souls (*Ārāʾ* and *Siyāsah*), it also acts as a final cause of motion for the celestial orbs. So far, then, we have identified two main principles of motion: the celestial souls and the separate intellects. The former represent a proximate principle that inheres in the celestial body, the latter a remote principle that is separate from it. As an additional division, one may distinguish between the *thawānī*, which are the specific movers of the orbs—each intellect corresponding to a main orb—and the First, which is a universal mover for the entire heaven.

More should be said about this last point. In *Ārāʾ* al-Fārābī mentions the "love" (*ʿishq*) that the heavenly bodies share with the *thawānī* for the First. In another passage, God is described as the "first object of love and the first object of affection" of the separate intellects.[52] In a similar vein, *Siyāsah* presents God as "the first object of love" (*al-maḥbūb al-awwal*) and "the first thing desired" (*al-maʿshūq al-awwal*).[53] All of these passages echo Aristotle's statement at *Metaphysics* 12.7.1072b3-4 that the final cause of the heavens "produces motion as being loved." Although al-Fārābī does not connect desire, intellection, and motion explicitly in his works, one may easily and justifiably make the link

[52] Al-Fārābī (1985a, 119–123 and 1985b, 69 ff.).

[53] Al-Fārābī (1964, 52). In spite of these statements, al-Fārābī does not develop the concept of imitation (*iqtidāʾ* and *tashabbuh*), which play an important role in the systems of many Greek and Arabic thinkers. For example, Alexander mentions them several times in *Mabādiʾ* (2001, 54–55, 70–71). Abū Sulaymān al-Sijistānī (1974a, 370; 1974b, 374–375) in his treatise on the celestial bodies explains that the souls of the planets desire (*yatashawwaqu*) the virtues (*faḍāʾil*) of the higher principle and "move the celestial bodies through will in order to imitate the First Cause" *(tuḥarrikuhā bi-l-irādah li-l-tashabbuh bi-l-ʿillah al-ūlā*).

between these various concepts on his behalf. In this picture, the First ignites intellectual love in the celestial souls, which in turn leads them to seek and imitate Its perfections. But since these souls inhere in a substrate and are therefore closely intertwined with the celestial body, they can never attain such perfections and must confine themselves to reproducing at a corporeal level and by means of the most perfect shape, i.e., the circle, the eternal activity of the higher entities. It is as a consequence of this constant search for the higher perfections, which they never attain, that the heavenly bodies perform their eternal revolutions.

In conclusion, then, it is primarily the intellective activity of the celestial souls that is responsible for the revolutions of the orbs, and more precisely, their contemplation of the First and the separate intellects, which act as final causes of motion. Although al-Fārābī does not describe the various stages of this process in detail, he provides hints and some rare statements in his corpus that enable one to reconstruct a fairly convincing picture of his celestial kinematics. This reconstruction is strengthened by the fact that the Second Teacher does not ascribe matter, inclination, or imagination to the orbs, which are other concepts commonly associated with motion in the Greco-Arabic tradition. Conversely, he stresses their purely intellectual nature and defines their main activity as intellection, which is accordingly the primary principle underlying celestial motion. But to what extent is al-Fārābī following the Arabic versions of Book Lambda on this issue, and to what extent is he following other philosophical and astronomical sources?

2.3.2. *Al-Fārābī and the Arabic Book Lambda*

We know that al-Fārābī had access to Book Lambda of *Metaphysics*, *Physics*, and *On the Heavens*, and thus that he was in possession of the principal Aristotelian texts dealing with celestial motion. However, al-Fārābī, unlike Aristotle and many other Greek and Arabic thinkers, does not correlate celestial matter and celestial motion. Despite the ambiguity in *On the Heavens* as to whether the movements of the orbs are caused by aether or soul, al-Fārābī unhesitatingly makes soul the main cause of celestial motion. In his cosmology, the concept of soul plays a central role not only at an ontological level with regard to the substantialization (*tajawhur*) of the heavenly bodies, but also with respect to his theories of motion. Hence, it would seem that *On the Heavens* exercised relatively little influence on al-Fārābī's

understanding of Aristotelian celestial kinematics and in the elaboration of his own kinematics.

This is definitely not the case of the Arabic version of Book Lambda, which may be seen as one of the foundational texts of al-Fārābī's cosmological system, be it only for the fact that it develops a theory of celestial motion based on the concepts of intellection and desire and that it posits separate unmoved movers in addition to the First Unmoved Mover, two key features that are found in al-Fārābī's model as well. I showed in chapter 2 that al-Fārābī construed this work as positing several separate movers and that in addition he probably relied on various other cosmological works, such as Themistius' paraphrase of Book Lambda, Simplicius' commentary on *On the Heavens*, and Alexander's *Mabādiʾ*, which also discuss these movers. But to what extent is the connection he establishes between intellection and motion foreshadowed in the Arabic versions of Book Lambda?

The theory that motion is caused by desire and intellection is explicitly articulated in Mattā ibn Yūnus' and Usṭāth's Arabic translations of Book Lambda. In textus 36, one reads that the First Unmoved Mover "imparts motion in the same way as the object of desire and the intelligible which is not moved; the first of these are the same"[54]; and in textus 37, that "the principle [of motion] is intellectual representation" and that "it [the Unmoved Mover] imparts motion as object of love."[55] One finds some departures from the original Greek text in the other translation of Book Lambda published by Badawī, which are even more pertinent to the problem at hand. For example, whereas the Greek text makes a general statement about the identity of the objects of desire and the objects of thought at 12.7.1072a26-28, the Arabic has: "The principle of love is only that which is contemplated from the First Cause" (*wa-ibtidāʾ l-ʿishq innamā huwa mā yuʿqal min al-ʿillah al-ūlā*),[56] thus explicitly identifying the first intelligible with the First, as well as the love It inspires with intellection. Equally significant is the sentence immediately following: "The motion of each intellect is [derived] from

[54] Ibn Rushd (1984b, 148).

[55] Ibn Rushd (1984b, 151). That the principle that is "intellectual representation" is a principle *of motion* is stressed by Ibn Rushd in his commentary on the same page: "the principle of this motion in the celestial body is intellectual representation. He [Aristotle] says that to make it known that the principle of this motion is not imagination, nor sense perception, but intellectual representation and the desire moving this body locally comes from the intellectual representation."

[56] Badawī (1947, 5).

the contemplated thing" (*fa-kull ʿaql fa-ḥarakatuhū min al-shayʾ al-maʿqūl*). This passage, which finds no parallel in the original Greek text, is important insofar as it establishes a direct connection between intellection and motion. Although it is not clear which intellect is referred to here, it is easy to imagine that classical Arabic thinkers could construe this passage as applying to the intellects of the orbs. This is especially true in the case of al-Fārābī, who defines the celestial souls as intellects. This excerpt may be compared to textus 37 in Ibn Rushd's *Tafsīr*, especially to the statement that "the principle [of motion] is intellectual representation," although it states even more emphatically the kinematic implications of intellection.

All in all, then, the Arabic versions of Lambda that have come down to us can account for some of the essential features of al-Fārābī's celestial kinematics. Not only can they be read as upholding the existence of several separate unmoved movers—as was shown in chapter 2—but they also present intellection as the principal cause of celestial motion. God and the other movers are objects of desire that inspire the contemplation and in turn the motion of the celestial souls. The translation of Mattā ibn Yūnus and the one edited by Badawī both establish a direct connection between celestial motion and intellection, which is less forcefully conveyed in the original Greek text. These passages provided a general source of inspiration for al-Fārābī's kinematic theory, which he further refined and elaborated by relying on the noetical doctrines articulated in the *Proclus arabus*. However, other aspects of al-Fārābī's cosmology, such as the radical distinction between the celestial souls and the separate intellects, and the presence of only ten separate intellects, are not explicitly articulated in the Arabic versions of Book Lambda and its commentaries and should be regarded as independent cosmological developments.[57]

There is, moreover, a striking astronomical-metaphysical difference between Aristotle's Book Lambda and al-Fārābī's account. In Aristotle's

[57] One can see that making intellection the main principle of celestial motion significantly facilitated the task of explaining the plurality and diversity of the celestial motions. In comparison, the aether theory developed in *On the Heavens* appears much more rudimentary. It is challenging to imagine how one homogenous and unchanging element may be responsible for a variety of motions, if it is assumed that aether is the main cause of motion. In contrast, the concept of intellection provides more leeway to develop a nuanced and flexible theory of celestial kinematics, as can be witnessed by al-Fārābī's and Ibn Sīnā's works. Aristotle himself may have also realized this, hence his introduction of the unmoved movers in Book Lambda.

cosmology, the outermost orb, which is the orb of the fixed stars, is moved by the First Unmoved Mover, that is, God, who stands at the apex of the hierarchy of movers. At 7.1072a22-24, Aristotle singles out this outermost orb as the first thing moved, which then presumably communicates its motion to the other lower orbs. In contrast, in al-Fārābī's cosmology, the outermost starless orb has the first separate intellect or *thawānī* as a specific mover, not the First. This means that no special relation is established between the First and the outermost orb in the manner achieved by Aristotle in Book Lambda. In al-Fārābī's system, in contrast, the First is a universal mover that moves all the orbs by standing as a common object of thought and desire. And it is presumably as a result of their common love and contemplation of It that the celestial bodies derive their basic kinematic impulse and the everlastingness of their motions.[58]

One may thus agree with R. Walzer's statement that God in al-Fārābī's system is not described as the First Unmoved Mover, if by this is understood the fact that God is not responsible for moving the outermost orb specifically.[59] However, al-Fārābī does state that the celestial souls all contemplate and desire God. Since he defines this contemplation as the main principle underlying celestial motion, then God must act as a final cause of motion for the entire heaven according to this model. In this regard God is the First Unmoved Mover, and Walzer's claim does not hold.

3. *The Problem of the Particular Motions of the Planets*

The foregoing analysis has clarified al-Fārābī's conception of the main principles underlying celestial kinematics, and it has located the source

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[58] This proposition, however, is difficult to reconcile with al-Fārābī's statement in *Siyāsah* to the effect that the general westward motion of the heavens is due to the influence of the outer orb, which is said to transmit a power (*quwwah*) to the other lower orbs. The problem is that if the First is a universal mover, and if all the orbs derive a common motion from their contemplation of the First, then it seems superfluous to posit a transmission of power from the outermost orb to the other inner orbs to explain the regular diurnal motion of the heavens. This motion might just as well be explained by the common contemplation and desire of the orbs for the First. This overlap is not properly accounted for by al-Fārābī and Ibn Sīnā. It is noteworthy that the idea that the First may move several orbs simultaneously, accepted straightforwardly by both al-Fārābī and Ibn Sīnā, was perceived as a puzzle by some of the ancient commentators; see Simplicius' report on Alexander in his commentary on *On the Heavens*, 270,9–12.

[59] Walzer stresses this point twice in his commentary (see al-Fārābī 1985a, 352 and 363, and note 169).

of celestial motion in the contemplative activity of the heavenly souls. However, it has left unanswered the key questions of how the particular motions of the planets occur and of how the diversity of celestial motions can be accounted for from a metaphysical point of view. The crux of the problem can be described as follows. Al-Fārābī follows Ptolemy in positing a multiplicity of planetary motions from west to east that differ from the diurnal motion of the outermost orb. Each one of these particular motions is performed by a minor orb or sphere associated with the planet. However, al-Fārābī does not posit one separate intellect or mover *per* orb and *per* motion, as Aristotle did, but merely ten separate movers. Hence the question arises: how is this plurality of particular motions possible, and on what grounds is it justified?

This problem is compounded by a cluster of minor, albeit related, issues. First, there is the ambiguity concerning al-Fārābī's description of the celestial souls: does each component within a system (planet, eccentric orb, etc.) possess its own distinct soul, or is the planet the only celestial body within its group to be ensouled? Alternatively, is the celestial soul diffused throughout the entire system? In most instances, al-Fārābī mentions the "souls of the celestial bodies" (*anfus al-ajsām al-samāwiyyah*) without specifying where they should be located. Second, what is the relation between the celestial powers (*quwan*) and the particular planetary motions? These questions are rendered more difficult by the fact that the existing evidence in al-Fārābī's corpus concerning the planetary motions is very limited and undermined by much ambiguity. In spite of this, the following paragraphs will provide a hypothetical reconstruction of al-Fārābī's views on these various issues by relying on the scant hints in his works and by drawing on the evidence that can be found in Ibn Sīnā's corpus. Some of this evidence has been mentioned in chapter 2, but it should be further examined here due to its relevance to the present topic.

3.1. *Ibn Sīnā and the Different Models of Planetary Motion*

Ibn Sīnā provides valuable insight in many of his works not only into his own views on celestial motion, but also into those of previous and contemporary thinkers. Whenever he addresses this topic, Ibn Sīnā usually describes two different kinematic models. As I have analyzed these two models as well as Ibn Sīnā's views in depth in a recent article, I will restrict the following discussion to the key elements that are

relevant to al-Fārābī's system.[60] The crucial passage that constitutes the starting point of the analysis appears in *Metaphysics* of *Shifāʾ* in the context of a discussion of the number of immaterial principles underlying celestial motion. Ibn Sīnā writes:

> If, in the case of the planetary orbs [*aflāk al-mutaḥayyirah*], the principle [*mabdaʾ*] of the movement of the spheres [*kurāt*] of each planet therein is a power emanating from the planets [*quwwah tafīḍu min al-kawākib*], then it would not be unlikely that the separate intellects would have the same number as the number of these planets—not the spheres—and their number would be ten, after the First. Of these, the first would be the unmoved mover that moves the sphere of the outermost body, then the one similar to it [that moves] the sphere of the fixed stars, then the one that is like it [that moves] the sphere of Saturn, and so on, terminating in the intellect that emanates on us [i.e., the Agent Intellect]. If, however, this is not the case, but each moving sphere has a rule governing its own motion and every planet, then these separate [intellects] would be of a greater number. It would follow, according to the doctrine of the First Teacher, that there would be something close to fifty and over, the last being the Agent Intellect. But you have known, from what we have said in *Mathematics*, what we have attained in ascertaining their number.[61]

In the 'first kinematic model' outlined by Ibn Sīnā, the planets are responsible for causing the various motions of the subordinate orbs and spheres attached to them by sending motive powers that are produced by the planetary souls. In this first model, only ten separate intellects are posited, which means that one intellect is ascribed to each one of the nine planetary groups, while the tenth intellect is the Agent Intellect governing the sublunary world. In contrast, in the 'second kinematic model,' each celestial body, including the subordinate orbs and spheres, i.e., the eccentrics and epicycles, possesses a principle responsible for its own autonomous motion. This model implies that each corporeal component is ensouled and contemplates its own, specific unmoved mover. Consequently, one must posit, like Aristotle, one separate intellect *per* orb and *per* motion, with a total of fifty orbs or more.[62] These two models may be represented schematically as follows:

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[60] Janos (2011).

[61] Ibn Sīnā (2005, 325,31–326,1, translation revised). The exact same passage appears in *Najāh* (Ibn Sīnā 1985, 310), and mention of emanating powers from the celestial souls can also be found in another passage of this work (1985, 296).

[62] Although it is not stated explicitly in this passage, Ibn Sīnā includes the eccentrics and epicycles in this number and ascribes them to Aristotle as well. This becomes clear when one compares this passage to the similar, albeit longer and more complete,

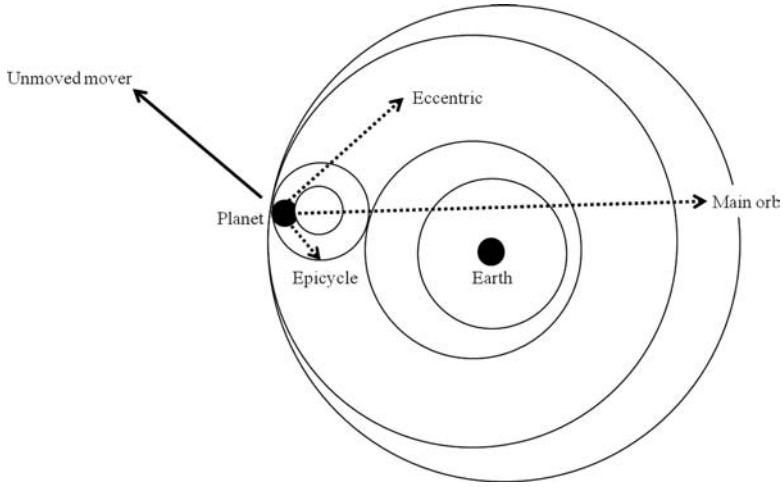

Figure 5A: Representation of the first kinematic model described in Ibn Sīnā's *K. al-Shifā'*: the planetary soul moves the various physical components of its system through emanating powers (*quwan*)

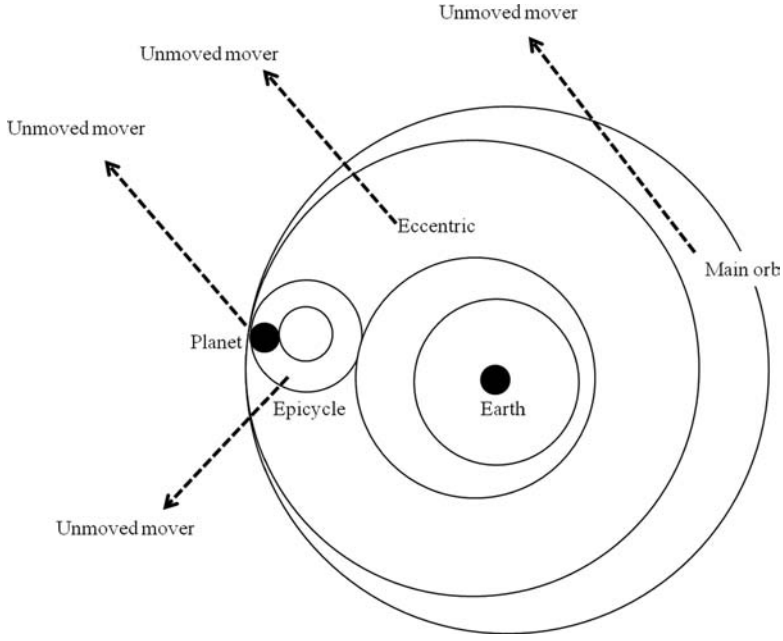

Figure 5B: Representation of the second kinematic model described in Ibn Sīnā's *K. al-Shifā'*: an unmoved mover is attributed to each corporeal component within a main orb

I wish to highlight a few important points with regard to this complicated excerpt. First, this passages occurs in an almost similar form in other works by Ibn Sīnā, such as *Mabdaʾ* and *Najāh*, and it also finds an echo in his *K. al-samāʾ*.[63] This shows that Ibn Sīnā paid considerable attention to the problems of the number of the separate intellects and how the intellects relate to the orbs. The recurrence of this passage in his corpus also says much about the order of composition of his works and his approach to philosophical writing.[64]

Second, and as I showed in my article on Ibn Sīnā, the 'first kinematic model' can best be described as a synthesis of Aristotelian and Ptolemaic theories. It is indebted to Aristotle in the sense that it posits separate intellects that act as unmoved movers—even though only ten such intellects are mentioned—and it is indebted to Ptolemy's *Planetary Hypotheses* in its adoption of powers that emanate from the planetary souls and are responsible for moving the eccentrics and epicycles associated with the planet. In contrast, the second kinematic model is more straightforwardly Aristotelian and based on the doctrines of Book Lambda 7 and 8, even though Ibn Sīnā introduces minor modifications in his account. In view of the importance of the 'first kinematic model' to properly understand al-Fārābī's cosmology, additional comments on its relation to Ptolemy's astronomical theories are called for.

A comparison between *Planetary Hypotheses* and the works of the *falāsifah* yields several important points. To begin with, Ptolemy rejects Aristotle's unmoved movers as they are defined by the Arabic philosophical tradition. The movers (sing. *muḥarrik*) mentioned in the Arabic version of *Hypotheses* refer instead to the main celestial orbs of the planets and not to the immaterial principles first formulated by Aristotle in Book Lambda and endorsed later on by the *falāsifah*.[65] This represents a crucial difference between our authors. While for al-Fārābī and Ibn Sīnā, the movers are both the celestial souls (the proximate movers) and the immaterial intellects (the remote movers), the latter acting as final causes and objects of contemplation and desire for the celestial souls, for Ptolemy a "mover" is a main orb that carries the planet around.[66]

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account that appears in *Mabdaʾ* (Ibn Sīnā 1984, 67–68). On this issue, see Janos (2011).

[63] Ibn Sīnā (1984, 67–68, 1985–1986, 648–649, and 1983–1986, 45 ff.).

[64] On this point, see Gutas (1988, especially 98–145).

[65] Goldstein (1967, 42).

[66] *Dānesh-nāmeh* provides a clear explanation of how both the celestial souls and the separate intellects can be called "movers" of the orbs; see Ibn Sīnā (1986, 242–243).

Moreover—and this point is of crucial importance for the upcoming discussion—Ptolemy explains the particular motions of the planets through the concept of a "vital power" or "psychological power or faculty" (*quwwah nafsāniyyah*) inherent in the planets. Ptolemy's theory of planetary power is exposed in Book 2 of *Planetary Hypotheses*, where the term *quwwah* appears repeatedly in his discussion.[67] Ptolemy regards the planets as ensouled beings, each operating independently from the other by virtue of its respective psychological powers. In one passage, Ptolemy compares the relation between the planetary soul and the orbs and spheres to the relation between the soul of a bird and its various bodily parts. Just as the animal soul transmits an emission (*inbiʿāth*) to the various limbs and muscles that make up the body of the animal, so the soul of each planet sends emissions that move the various corporeal parts attached to this planet.[68]

While it is unclear to what extent Ptolemy wants us to construe this analogy literally, it adequately reflects his theory of celestial kinematics, which presupposes the existence of motive powers inherent in each planet that can be distributed to the corporeal devices associated with it. As Murschel explains, "Each planet … has the power to direct its own motions and the motions of the adjacent celestial bodies within its own system. … The planet's psychic faculty sends motive emissions to the epicycle, then to the deferent, then to the outermost of that planet's celestial bodies, which is concentric with the earth."[69] What this means is that the kinematic model involving ten unmoved movers described by Ibn Sīnā, which is in essence an adaptation of the Aristotelian theory of the unmoved movers as exposed in Book Lambda 7 and 8, is combined with the Ptolemaic doctrine of the planetary powers. Hence, the kinematic model described by Ibn Sīnā is a synthesis of various theories stemming from two very different cosmological traditions, the Peripatetic and the Ptolemaic.

It is noteworthy that this kinematic model is described in other classical Arabic sources. *Talkhīṣ mā baʿda l-ṭabīʿah*, a treatise which can be

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[67] Goldstein (1967, 36, 40–41); see also Murschel (1995, 38–39).

[68] Goldstein (1967, 40–41). For more information on the concepts of "action at a distance" and "moving soul" (*al-nafs al-muḥarrikah*) in *hayʾah*, see Ragep (1993, vol. 2, 409–410). Ragep's discussion focuses on al-Ṭūsī's astronomy, but it is strikingly close to what we find in Ptolemy and Ibn Sīnā. This raises the possibility of a direct continuity of the concept of psychological power in the works of these thinkers.

[69] Murschel (1995, 39).

attributed to Ibn Rushd only hypothetically, discusses a very similar theory, which indicates that this view was known in other parts of the Islamic world, at least in those circles that cultivated the study of Greek cosmology. Ibn Rushd writes:

> As to [the question of] whether it is possible to posit fewer movers than the number [which we have indicated, i.e., 47 or 55], as some of them think [i.e., some of the philosophers of the past], this is because they assign to each [main] orb only one mover which moves the planet only, from which [i.e., the planet] then emanates powers [*quwan*] that coordinate the other motions which characterize this planet and which occur due to it.[70]

And Ibn Rushd defends a more Aristotelian approach by adding: "but we have shown this to be impossible."[71] The position criticized by Ibn Rushd shows obvious parallels with the one described by Ibn Sīnā in his *Shifāʾ*. In both cases, the planet is made the chief of its cosmological 'system' and is responsible for moving the corporeal devices associated with it. Powers are transmitted from the planetary soul to the spheres and orbs, in a way similar to the manner in which the animal soul moves the various limbs of the animal body.[72] Finally, the later astronomer and philosopher Naṣīr al-Dīn al-Ṭūsī also alludes to a similar kinematic model in his commentary on Ibn Sīnā's *K. al-ishārāt wa-l-tanbīhāt*.[73]

Ibn Sīnā, Ibn Rushd, and al-Ṭūsī therefore describe an identical model of celestial motion, which seems to have been quite popular during the classical period. It departs from the Peripatetic one both in positing fewer unmoved movers than the number recommended by Aristotle and in combining this revised theory with the Ptolemaic concept of planetary powers. Here, however, we reach a set of difficult questions: which kinematic model was endorsed by al-Fārābī? Does this theory of emanating planetary powers find any parallel in his works? And how are the various and at first glance eclectic theories of the separate intellects, celestial souls, and emanating powers reconciled with the planetary models he inherited from Ptolemy?

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[70] Ibn Rushd (1958, 134, sec. 22).
[71] Ibn Rushd (1958, 134, sec. 22).
[72] For this parallel, see Janos (2011).
[73] In Ibn Sīnā (1957–60, vols. 3–4, 618–19).

3.2. *A Hypothetical Reconstruction of al-Fārābī's Kinematic Model*

The question of which model al-Fārābī adopted is highly significant, since it concerns the fundamental structure of his cosmology and has an impact on his theories of celestial causation and motion. I already had the opportunity of analyzing this question with respect to Ibn Sīnā's cosmology in my article and concluded that in spite of what is frequently asserted in the secondary literature, Ibn Sīnā upheld the second kinematic model, which assumes an identical number of unmoved movers/separate intellects and celestial bodies and motions. It thus follows that Ibn Sīnā adhered to a revised version of Aristotle's model, although the total number of orbs and movers in his system may be higher due to Ibn Sīnā's uncertainty as to whether the fixed stars are attached to one or several different orbs.[74]

What is significant for our purposes is that Ibn Sīnā describes these two kinematic models primarily for the sake of comprehensiveness and deliberately seeks to distance himself from the first kinematic model, which he ascribes to other Arabic thinkers. In this regard, however, neither Ibn Sīnā, nor Ibn Rushd, nor even al-Ṭūsī mentions by name those thinkers who endorsed the ten-intellect model. Yet there can be little doubt that they primarily had al-Fārābī's cosmology in mind, or that they associated this model chiefly with the Fārābīan philosophical tradition, perhaps in the form in which it was later adapted by al-Kirmānī.[75] This is because al-Fārābī is the only thinker we know of in the early Arabic context who explicitly upheld the ten-intellect theory and discussed it in detail in his cosmology. Indeed, he states explicitly that there are only ten separate intellects, so that the number of separate movers cannot exceed this number.[76] More specifically, he connects each 'celestial group' or system (*jumlah*) with a separate intellect, establishing a parallel hierarchy of nine celestial groups and nine separate intellects, excluding the Agent Intellect. This aspect of al-Fārābī's cosmology directly influenced Ibn Sīnā, who reproduces this celestial structure, even though it was substantially adapted and transformed by the *shaykh al-raʾīs*.

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[74] There are other important differences, which I cannot discuss here. For instance, Ibn Sīnā applies Aristotle's theory of the unmoved movers to Ptolemy's models of planetary motion consisting of eccentric orbs and epicyclic spheres, and he also attributes such models to Aristotle.

[75] De Smet (2008).

[76] Al-Fārābī (1985a, 114–115 and 1985b, 67).

This indicates that Ibn Sīnā was almost certainly referring to his predecessor's views in this passage of *Shifāʾ*. Since Ibn Rushd and especially al-Ṭūsī—whose report appears in his commentary on *Ishārāt*—studied Ibn Sīnā's works carefully, it is probably through a knowledge of these Avicennan works—if not by reading al-Fārābī's treatises directly—that they reproduced the same exposition of celestial kinematics. Hence, it would appear that al-Fārābī was known in the later Arabic philosophical tradition as one of the main exponents of this ten-intellect kinematic model.

But here further difficulties arise. How are we to explain the relation between the intellect and the multiple corporeal bodies and motions associated with its system? The first point concerns the ensoulment of each component in a group. Since al-Fārābī endorsed the ten-intellect theory and ascribed only one separate mover to each planetary 'system,' it is possible by the same token that he would have posited only one soul as well *per* 'system' and considered the planet to be the only ensouled entity of its group. For as both Ibn Sīnā and al-Ṭūsī explain, the exponents of this model regard each planetary group as a single entity animated by one soul, which is located in the planet. And they compare this cosmological arrangement to the sublunary animal, whose various limbs and muscles are moved by the soul located in the heart. Although al-Fārābī never specifies which celestial bodies are ensouled and which are not, it is reasonable to conclude that he may very well have endorsed this view, which locates each one of the nine celestial souls in the planets and, in the case of the orb of the fixed stars and the outermost orb, which is planetless, in the orb itself.[77]

An even more delicate issue pertains to al-Fārābī's conception of the interplay between the celestial souls and the celestial bodies and how his views relate to Ptolemy's *Planetary Hypotheses*. Is there any evidence in Fārābī's corpus concerning the emanating powers (*quwan*) described by Ibn Sīnā in connection with the first kinematic model of ten separate intellects? And how is the transition from contemplation to physical motion explained by al-Fārābī?

The first question of how the theories of planetary powers developed by Ptolemy in *Planetary Hypotheses* and later described by Ibn Sīnā in

[77] One should remember that the orb of the fixed stars and the outermost orb have two motions and a single motion respectively, which means that no eccentrics or epicycles are needed to account for their simple motion; more on this model below.

his works apply to al-Fārābī's cosmology is a difficult one, first because al-Fārābī provides barely any information on this subject, and second because no thorough edition of the entire *Planetary Hypotheses* exists.[78] At first glance, al-Fārābī's position seems to allow for the possibility that these powers are transmitted mechanically from orb to orb. This could be the case with the primary universal motion, which, al-Fārābī says, is communicated by the first outermost orb to all the other orbs, and which is presumably how Aristotle understood this process.[79] However, I have already expressed my reluctance to ascribe a mechanistic model of motion to al-Fārābī, for the main reason that soul and intellect are the main principles of his cosmology and do not coexist harmoniously with a mechanistic model. Although al-Fārābī does not explain from which source the celestial powers originate, his use of the term and concept of *quwwah* in connection with the particular celestial motions in *Siyāsah* establishes a strong link with Ptolemy's *Planetary Hypotheses*. Indeed, his statement that "they [the celestial bodies] possess other powers [*quwan*] by virtue of which … their motions differ" seems close to the meaning conveyed in the Ptolemaic texts.[80]

But assuming for a moment that al-Fārābī follows Ptolemy on this issue and that the planetary souls are responsible for emitting these powers, where is one to locate the soul and powers of the outermost orb and of the orb of the fixed stars, which do not contain a wandering planet? In the case of the outermost orb, this power would be emitted by a soul that inheres in the entire orb, since it is planetless, and it would then be communicated through its body to the other orbs it surrounds. In the case of the orb of the fixed stars, the soul would again inhere in the entire orb, since the stars are fixed on the orb and do not possess a specific motion of their own. Hence, the power emitted by this soul would be responsible solely for the precessional movement of this orb. Finally, in the case of the planetary orbs, the soul would be located in the planet specifically, from which powers (*quwan*) would be transmitted to the various corporeal devices or components associated with this planet and responsible for its particular motions.

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[78] This will shortly change, however. An edition and French translation of Book 2 is being prepared by R. Morelon, who already published Book 1 (Morelon 1993), and J. Ragep and A. Jones are working on a new edition and English translation of this important text.

[79] *Metaphysics* 12.8.1073b25-27.

[80] Al-Fārābī (1964, 55); see also the section on *quwwah* above.

This model, including the idiosyncratic distribution of the celestial souls and their powers, is described in detail by Ibn Sīnā and al-Ṭūsī in their works.[81] As Ibn Sīnā writes in *Mabdaʾ*,

> a group among the learned [*qawman min al-afāḍil*] consider the planet [*kawkab*] in its main orb [*fī kuratihī kulliyyah*] to be like the heart [in the animal]. They make the [power of the] soul emanate from it [*tafīḍu minhu*] [i.e., the planet] onto the particular [or minor] orbs [*al-kurāt al-juzʾiyyah*] and cause the various motions by analogy with the motions of an animal, except for the orb of the fixed stars [*falak al-thawābit*], for indeed they claim that its motive power [*al-quwwah al-muḥarrikah*] is emitted to the stars [*kawākib*] from their orbs [*kurātihā*].[82] And [in this case] the orb [*kurah*] will be the heart and the stars in them will be like the limbs [of the animal].

And Ibn Sīnā continues:

> So according to them, each main orb has only one soul, which has a location [i.e., in the planet], and this approach also necessitates that the desired principles [i.e., the separate intellects] correspond *not* to the number of the minor [or subordinate orbs] [*al-kurāt al-juzʾiyyah*], but rather to that of the main orbs [*al-kurāt al-kulliyyah*].[83]

This description evokes the model outlined in Ptolemy's *Planetary Hypotheses* and is a more complete account of the 'first kinematic model' than the one found in *Metaphysics* of *Shifāʾ*. Ibn Sīnā ascribes this more elaborate position to "a group among the learned," and in another passage of the same work, to "the moderns" (*al-mutaʾakhkhirūn*).[84] These attributions suggest that Arabic thinkers either shortly before or during Ibn Sīnā's own time had endorsed this model, and they could very well refer implicitly to al-Fārābī. When one realizes that al-Fārābī's cosmology includes a) the theory of the ten separate intellects, b) possibly an equal number of celestial souls, and c) celestial powers (*quwan*), which are explicitly connected with the particular celestial motions (if not with the planets specifically), then it

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[81] See Ibn Sīnā (1984, 71 and 1983–1986, 45 ff.); cf. al-Ṭūsī (in Ibn Sīnā 1957–60, vols. 3–4, 618–619). For an analysis of these passages, see Janos (2011).

[82] It is perplexing that the text has the plural form *kurāt*, since the description concerns the orb of the fixed stars, which is unique and which is otherwise referred to in the singular in this passage. This oddity can be explained either by an editing mistake or by Ibn Sīnā's potential reference to the hypothesis that the stars are fixed on various smaller orbs within the main orb of the fixed stars.

[83] Ibn Sīnā (1984, 71).

[84] Ibn Sīnā (1984, 68).

becomes not only possible, but highly probable that al-Fārābī was one of the main exponents of this cosmological model.[85] Although it is unclear whether al-Fārābī located the celestial souls specifically in the planets, the existing evidence nevertheless seems to support his endorsement of this model.[86]

Finally, a last point has to be addressed. It pertains to the question of how the planetary powers are transmitted from the planetary souls to the various corporeal components of its group and actualize the planetary motions. In other words, how is the planetary souls' intellectual contemplation of the separate intellects transformed into motion in a physical body? In the kinematic picture described above, this point remains ambiguous, and al-Fārābī fails to explain it adequately. This is all the more problematic, since he defines the celestial souls as being devoid of the inner senses of imagination (*takhayyul*) and estimation (*wahm*) and as possessing only rational thought. In spite of this, and in

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[85] Other hints seem to support this interpretation. First, al-Fārābī's use of the term *jumlah* to refer to the various orbs and spheres associated with a planet as a coherent 'group' or 'system.' This concept would be difficult to understand if each orb and sphere was completely independent and possessed its own principle of motion that was distinct from that of the planet. Second, al-Fārābī's belief that the heart is the main seat of the inner senses and the soul in animals also lends weight to this hypothesis, since al-Ṭūsī mentions explicitly (in Ibn Sīnā 1957–60, vols. 3–4, 618–619) that the exponents of this kinematic model compare the planet and its soul to the heart of the animal and make it the source from which motion originates, while they compare the various corporeal devices associated with it to the limbs or muscles. It is notable that, unlike Ibn Sīnā, al-Fārābī followed Aristotle rather than Galen when it comes to assigning a corporeal location to the soul and the inner senses specifically; see al-Fārābī (1985a, 175 ff. and 1985b, 92 ff.), where the heart is defined as the "ruling organ" in the animal body.

[86] If one rejects this interpretation, then it becomes very difficult to understand how al-Fārābī could account for the plurality of planetary motions by positing only ten separate intellects. Ibn Sīnā and al-Ṭūsī at any rate do not propose an alternative model that relies on only ten intellects. This point, for what it is worth, may be seen as additional negative evidence that al-Fārābī endorsed the model outlined above. One may propose an alternative interpretation, which also makes use of the ten-intellect theory, but rejects the special status given to the planetary souls: all the orbs and spheres of a group could be ensouled, and motion could be explained by the particular contemplation of these entities for the same separate intellect. This means that a separate intellect would be the common object of thought of several celestial souls contained within the same system, but their contemplation would differ on the basis of their varying place and status in the celestial hierarchy. That a single mover can be contemplated by various intellects is shown in al-Fārābī's cosmology by the status of the First, which is a universal object of thought and which is desired by all the celestial bodies and separate intellects below it. Thus, and by transposition, each separate intellect could be an object of thought for all the entities of its 'group.' While possible, this theory seems less convincing, and it finds no echo in the works of later authors who discuss celestial kinematics.

light of the testimony adduced by Ibn Sīnā and al-Ṭūsī, it is reasonable to think that al-Fārābī would have modelled his account of how motion is produced in the celestial body on his theory of animal motion. Al-Ṭūsī and Ibn Sīnā both intimate in their report that the ten-intellect kinematic model rests on a close analogy with animal motion. For on their account, the thinkers who upheld this model compared the planetary soul to the animal soul located in the heart, and they compared the other corporeal devices attached to the planet—i.e., the eccentric orbs and epicycle spheres—to the various limbs of the animal.

Now, we know that al-Fārābī located the animal soul chiefly in the heart, as Aristotle had—as opposed to Ibn Sīnā, who located it chiefly in the brain and whose view was thus indebted to the Galenic tradition. The few remarks al-Fārābī makes concerning animal motion in his works are easily compatible with this kinematic model and with the theory of emanating powers. He describes the presence of powers (*quwan*) that are diffused throughout the limbs and muscles of the animal body and that are connected to the central seat of the soul in the heart.[87] The animal heart also diffuses innate heat (*al-ḥarārah al-gharīzah*) throughout the body. It is the ruling organ (*al-ʿuḍw al-raʾīs*) to which the other organs and the bodily parts are subordinated.[88]

These key physiological points go hand in hand with the other elements mentioned above and strongly support the hypothesis of al-Fārābī's adherence to the ten-intellect kinematic model. According to this view, al-Fārābī would have applied a similar explanatory framework to sublunary and superlunary motion, which relies on the analogy of the heart in the animal body and its role as ruling organ. The heart as seat of the animal soul corresponds to the planetary soul, while the organs and limbs correspond to the orbs and spheres. Powers are transmitted from the heart/planetary soul to the bodily parts, which enable motion to take place. In the case of the planetary souls, these powers are generated as a result of their ongoing attempt to imitate the perfection of the immaterial principles. The planetary souls strive to acquire these perfections, but due to their corporeal nature and their

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[87] Al-Fārābī (1985a, 170–171, translation slightly revised, and 1985b, 90): "These powers [*quwan*], then, which are in parts of the body like these [i.e., hands, feet, etc.] are all of them bodily instruments and subordinate to the ruling appetitive faculty within the heart."

[88] Al-Fārābī (1985a, 174–177 and 1985b, 92–93).

close association with the celestial body, they can only perform constantly renewed acts of will and desire that translate into particular and renewed powers and motions.

In spite of this, al-Fārābī does not provide a detailed explanation of the issue of how motion is actualized in the celestial body. It is probably this shortcoming in al-Fārābī's cosmological accounts that can explain why Ibn Sīnā addresses this difficult issue in depth in *Mabdaʾ*, in *Metaphysics* of *Shifāʾ*, and in other works, and why he endows the celestial souls with the faculties of imagination and estimation. According to Ibn Sīnā, the celestial soul is primarily engaged in the conceptualization of particulars and changing things. It is corporeal and inextricably linked to the celestial body whose form it constitutes.[89] Ibn Sīnā's articulation of the theory of the inner senses (*ḥawāss bāṭinah*) had a direct impact on his celestial kinematics, for it helped him to bridge the gap between the immaterial and material principles involved in causing motion, even though his account is not without its own limitations.[90] Ibn Sīnā compares the activity of the celestial soul and its relation to the celestial body to the human soul and body and adopts a similar framework for explaining motion in both cases, which relies on these psychological elaborations.

I will conclude by saying that al-Fārābī most likely adhered to the 'first kinematic model' described by Ibn Sīnā. His theory of the particular motions of the planets probably included powers emanating from the planetary souls, even though it is grounded primarily in the concepts of intellection and final causality. Only limited insight can be given as to how exactly this theory worked in its details, but in what precedes I provided a hypothetical reconstruction of al-Fārābī's views that has the merit of incorporating all the hints that can be gleaned from his corpus as well as the evidence that can be drawn from later reports. The foregoing analysis enables us to conclude that al-Fārābī's account of celestial kinematics appears as an original and idiosyncratic adaptation of Book Lambda, which adapts the Aristotelian theory of the unmoved movers and combines it with Neoplatonic noetical theories and Ptolemaic kinematic material drawn from *Planetary Hypotheses*. Although al-Fārābī's method of synthesizing these philosophical and astronomical theories is inscribed in the late antique

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[89] Ibn Sīnā (2005, 312,4 ff.).

[90] One of these problems is how the inner senses relate to the rational faculty of the celestial bodies; see Janos (2011).

philosophical tradition, the kinematic model that resulted from it was innovative and does not have a clear precedent in the Greek and early Arabic contexts.

3.3. *Celestial Kinematics and the Classification of the Sciences in falsafah*

The study has shown on the one hand that al-Fārābī adopts the Ptolemaic theories of eccentrics and epicycles, which he views as subordinate corporeal components encompassed by a main orb and belonging to a celestial 'group' or 'system,' and on the other hand that he develops a theory of motion that synthesizes information from the Arabic versions of Book Lambda and from Ptolemaic and Neoplatonic sources. The fundamental idea that emerges from al-Fārābī's model is that soul, and more precisely, the intellectual activity of the celestial souls, is the primary principle underlying celestial motion.

The juxtaposition of these various features and theories in al-Fārābī's cosmology raises the question of their compatibility. What is the explanatory function of the eccentrics and epicycles, which according to al-Fārābī have a corporeal existence, if motion is ultimately caused by the heavenly souls? In other words, to what extent can these eccentrics and epicycles also be called causes of motion? This issue is particularly relevant when it comes to the systems of medieval philosophers, many of whom practiced physics, metaphysics, and astronomy at the same time. With regard to the Second Teacher, this problem is encapsulated in a passage of *Mūsīqā*, where, following a Greek custom, he defines the eccentrics and epicycles as "causes" (*asbāb*) of motion.[91] Al-Fārābī does not provide any clue as to how one should understand this statement and construe the juxtaposition of the astronomical and (meta-)physical principles in his account. The answer sketched below is an attempt to make sense of this difficult issue and may be fruitfully applied to other thinkers, such as Ibn Sīnā, who also combine a psychological theory of motion with an eccentric-epicyclic model derived from the Ptolemaic tradition.

Whether the term *sabab* is translated as "explanation" or "cause," calling eccentrics and epicycles *asbāb* clearly betrays on the part of a medieval thinker like al-Fārābī a concern for the fundamental

[91] Al-Fārābī (1960a, 102) and chapter 1, 2.1–3.

principles that underlie celestial motion, and more specifically, the particular motions of the planets. From the viewpoint of a human observer, these planetary motions seem to diverge from the universal westward motion of the heavens, a fact which had to be accounted for. One notices in this respect that this concern is inscribed within, and presupposes, a more general theory of kinematics, since the eccentrics and epicycles were devices used to explain the specific planetary motions and therefore the more subtle and difficult observations of the celestial phenomena. But of greater priority or importance was the need to explain, first, the causes of celestial motion in general, and second, the universal westward motion, which is common to all the orbs. In other words, the theories of the eccentrics and epicycles do not and cannot address the fundamental questions: Why do the celestial orbs move? And why is the heavenly motion circular?

To these questions, as we have seen, Arabic thinkers answered by postulating physical and metaphysical principles such as aether, soul, and intellect, which were at once philosophically more basic and endowed with a greater interpretive potential than the mere devices of epicycles and eccentrics. These principles were intended to explain not only the regularity and perpetuity of the heavenly motion, but also its circularity. For example, the physical proposition of aether implied an inherent inclination for circular motion within the celestial body, whereas the mathematical-metaphysical interpretation of the circle *qua* most perfect shape made it the formal equivalent of the eternal intellection and self-reflexivity of the orbs.

And indeed, it is precisely to this type of physical argumentation that al-Fārābī alludes in *Mūsīqā*, where he explains that the astronomer must rely on principles derived from natural philosophy in order to account for the basic motion of the orbs. While physics and the aether theory in particular proved helpful in this respect, the most fundamental explanation of celestial motion provided by the *falāsifah* rested on metaphysics and more specifically on the concepts of soul and intellect. Hence, to the basic question: Why do the celestial bodies move? The philosopher could answer by arguing that they are animated, rational beings that move by choice (*ikhtiyār*), will (*irādah*), and intellectual desire (*shawq*), as well as by virtue of their contemplation (*taʿaqqul*). Ultimately, it is their contemplation of, and desire for, the separate movers and their act of reversion toward these principles that induces their heavenly revolutions. It is to this type of metaphysical model that al-Fārābī alludes fleetingly in *Siyāsah*, when he

states that "they [the celestial bodies] move in circular fashion by virtue of them [i.e., their souls]."[92]

But there is no obvious reason why the physical and metaphysical explanations of celestial motion should be in any way incompatible with the subordinate and more specifically astronomical question of why the planets possess particular motions. To perceive an incompatibility between these questions and the solutions proposed by the Arabic philosophers is, I think, to misconstrue modes of argumentation that were seen as complementary. Thus, when al-Fārābī presents intellection, and Ibn Sīnā intellection and imagination, as the main principles underlying celestial motion in their philosophical treatises, they are approaching the question of celestial kinematics from a physical and metaphysical perspective, i.e., with the intention of clarifying the fundamental causes of celestial motion *per se*, a question whose answer requires investigation into the essence of the celestial bodies and the immaterial causes that govern them.

And indeed, it is no coincidence that such an analysis appears in the metaphysical sections of their works, as is attested, for instance, by *Ārāʾ*, *Siyāsah*, and *Fī l-ʿaql* in the case of al-Fārābī, and by the *Metaphysics* of *Shifāʾ* in the case of Ibn Sīnā. If then asked why the planets each possess trajectories that are proper to them, they could give a metaphysical explanation for this phenomenon, namely, by resorting to the kind of intellection proper to each celestial soul and to the existence of a specific immaterial mover corresponding to it.[93] In addition, they could refer the inquirer to their astronomical writings, which provided an astronomical-physical explanation based on the devices of the eccentrics and epicycles. Moreover, they could have argued that the question of the particular planetary motions falls primarily within the purview of the astronomical discipline and that it is the *skopós* of astronomy, rather than metaphysics or natural philosophy, to address it. Indeed, according to their classification of the sciences, astronomy is the discipline that studies the various celestial movements.[94] Yet the fact remains that both metaphysics and astronomy—here construed as a combination of mathematical astronomy and celestial physics—could

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[92] Al-Fārābī (1964, 34).

[93] Ibn Sīnā (2005, 317,34–39).

[94] In *Iḥṣāʾ*, al-Fārābī subsumes the study of the various celestial motions under the subject matter of mathematical astronomy or *ʿilm al-nujūm al-taʿlīmī*; see chapter 1, 2.1.

contribute to solving this problem. The issue of the planetary motions is therefore a perfect illustration of the kind of philosophical problem which overlapped various disciplines, which could be interpreted from different angles, and for which different causes or explanations could be mustered.

This general assumption concerning the compatibility of astronomy and the other sciences such as physics and the reliance of the former on the latter was already upheld in antiquity, Geminus being a notable example. We saw that the Arabic *falāsifah* adopted a similar approach and that many hints in their works indicate that they aimed to achieve some kind of reconciliation between the physical and astronomical disciplines. In that sense, they were continuing a trend that had its roots in antiquity. But what is remarkable in the works of the *falāsifah* is the willingness to extend this approach to the subject of celestial motion in particular, whose difficulty they, especially Ibn Sīnā, were highly aware of.

In spite of this, al-Fārābī and Ibn Sīnā, and the other *falāsifah* for that matter, do not provide a unified and integrated account of the astronomical, physical, and metaphysical causes of celestial motion *within the same work*, except somewhat briefly (as the passage of *Metaphysics* of *Shifāʾ* discussed in the previous section shows). One may surmise that their adherence to Aristotle's *Posterior Analytics* and to the hierarchy of proofs and compartmentalization of the philosophical disciplines it advocates was too strong for an independent literary genre combining these various approaches to be fully realized within *falsafah*. While providing a basic framework for their philosophy as a whole, the authority in which the Arabic philosophers held this work might have simultaneously impeded a real breakthrough with regard to their theorization of certain issues, such as celestial motion.

Moreover, al-Fārābī and Ibn Sīnā might also have been influenced to some extent by Ptolemy's perception of the sciences. Ptolemy not only criticized the cosmological value of physics and metaphysics in *Almagest*, but also provided in this same work an account of planetary motion that relies lightly on physical considerations and that is virtually free of any metaphysical assumptions. Although Ptolemy's ideas at first glance fitted awkwardly with the *falāsifah*'s more inclusive approach and their belief in the interrelatedness of the sciences, they might nonetheless have had an impact on the Arabic thinkers. Even al-Ṭūsī's *Tadhkirah*, which is closer to this ideal philosophical synthesis, mentions some key physical concepts, but says virtually nothing about the

role of the metaphysical principles of soul and intellect in connection with motion—a topic which is however discussed at length in some of al-Ṭūsī's other works, such as his commentary on Ibn Sīnā's *Ishārāt*.[95] This indicates that al-Ṭūsī and some of the *hayʾah* authors, though in some ways more successful in their synthetic approach than the earlier *falāsifah*, also experienced difficulty accommodating the different disciplinary accounts on celestial motion in a single work.[96]

Another potential impediment may have been the distinct textual traditions from which these theories were derived. Even though they are to some extent combined in the works of the Arabic *falāsifah*, and even though some of the late antique commentaries had anticipated the Arabic works in integrating astronomical and more specifically Ptolemaic theories into the mainstream philosophical discourse—a prime example is Simplicius' commentary on *On the Heavens*—it should be stressed that the *falāsifah* would have had to engage with what was virtually two distinct intellectual traditions: the astronomical one and the philosophical one. This holds both with regard to the early Islamic social and cultural context, where thinkers could practice both astronomy and philosophy, but where the majority were either known as astronomers or philosophers, and with regard to the Greek to Arabic translation movement, whose output may be partially, albeit clearly, divided into a philosophical part and an astronomical part. Indeed, the translators who specialized in astronomy were not necessarily well versed in philosophical matters and vice versa.

Consequently, it is surely not because the *falāsifah* considered the various principles underlying celestial motion and their interpretation as paradoxical or irreconcilable, but rather because they regarded them as belonging to different disciplines and as requiring a different kind of

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[95] Ṭūsī begins *Tadhkirah* by explaining that "those of its [i.e., astronomy's] principles that need proof are demonstrated in three sciences: metaphysics [*mā baʿd al-ṭabīʿah*], geometry, and natural philosophy" (Ragep 1993, vol. 1, 90). He then proceeds to a detailed account of the mathematical and physical principles (Ragep 1993, vol. 1, 41–46, 98 ff.), but the expected account concerning the metaphysical principles does not follow.

[96] Indeed, while the mathematical and physical aspects seem to have been quite harmoniously reconciled by al-Ṭūsī in his *Tadhkirah*—a fact which is attested at a basic level by the assumption of the corporeality of the orbs and spheres, including the eccentrics and epicycles—his work does not provide an extensive treatment of the metaphysical causes of celestial motion. Here again, one suspects that this omission is due to a disciplinary division and to the different *skopós* assigned to the various philosophical genres.

analytical treatment, that these were addressed in different works. The problem pertains more to issues of method, philosophical *skopós*, and to these thinkers' classification of the sciences than to any inherent incompatibility between the various scientific disciplines. These comments give us a measure of the originality, difficulty, and scope of the *falāsifah*'s project to combine astronomy, physics, and metaphysics in a more or less systematic way, even if their endeavour was not fully successful or appears incomplete from the viewpoint of a modern scholar.

There remains the thorny question of what type of proofs the various sciences provide with respect to celestial kinematics. Here we are in murkier waters. I already tried to address this question in chapter 1 with respect to al-Fārābī's method of astronomy and can only add a few remarks here. Al-Fārābī makes it clear in *Burhān* that the various sciences—and he mentions physics and astronomy explicitly—can identify different causes to explain the same thing.[97] In the context of astronomy, he even gives the sphericity of the world and the planets as an example. This question can be treated by astronomy and physics, which both use a different method and examine different causes: the formal cause in the case of the mathematical disciplines, the four causes in the case of physics.[98]

In the case of celestial motion, al-Fārābī does not provide any hints as to whether the same interdisciplinary approach applies, and how it applies, although one may surmise that it does. Physics, by examining the celestial substance, can yield knowledge of the material cause of celestial motion; aether is after all regarded as an element or body possessing its own qualities in the Peripatetic tradition. Building on the insights of physics and relying on observations, astronomy then posits geometric devices (epicycles and eccentrics) to explain the particular motions of the planets. These devices, it should be stressed, are also conceived of as bodies (*ajsām*) and are meant to correspond to physical reality, that is to say, to the way that the heavens are actually structured.[99] Consequently, the eccentrics and epicycles, as well as the main

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[97] Al-Fārābī (1985c, vol. 4, 68) and chapter 2, 2.2.3.

[98] This view also appears in one of the surviving excerpts of Abū Bishr's commentary on *Physics*; see Arisṭūṭālīs (1964, 137) and McGinnis and Reisman (2007, 122).

[99] This in turn explains why many ancient and medieval thinkers believed the orbs and spheres to consist of the same celestial substance as the planets, such as aether or another principle. Yet others held that because of their difference in visibility—the

orbs, may be regarded as possessing a causal or at least an instrumental function in the process of heavenly motion, in the sense that they literally carry the planets around, in the same way that the hand carries an object.

At another level removed from the corporeality of the celestial orbs and spheres, metaphysics posits soul and especially intellect as another set of causes, this time of a final kind. The planetary soul is a proximate cause of motion, and indeed Ibn Sīnā defines it as the "proximate mover" (*muḥarrik qarīb*) of the planets and orbs.[100] The celestial souls contemplate the separate intellects and the First, and it is this contemplation which in turn produces celestial motion in the celestial bodies. In addition to the celestial souls, the separate intellects themselves, as well as the First, are final causes that act upon the souls as objects of desire. These various, separate intellects are remote causes of motion, since they are not attached to matter or connected with the celestial bodies in any way, but they entice the celestial bodies to move through the perfection of their existence. They are, like the First, final causes, since they represent the *telos* which the celestial souls strive to reach.

If this interpretation is correct, then al-Fārābī, and later Ibn Sīnā, posited a whole array of kinematic causes superimposed on one another. These causes are at once distinct and intricately connected. They are organized in a hierarchical fashion, in that some are more fundamental than others. This hierarchical explanatory scheme clearly relies on these philosophers' conception of the interrelatedness and cooperation of the sciences, as well as on the concept of final causality they inherited from Aristotle. But it also has important ramifications insofar as the various types of proofs are concerned. For it shows that the *falāsifah* recognized various orders of causality and accepted various levels of explanation and perhaps demonstration with regard to celestial motion.[101]

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orbs being transparent, the planets opaque—different kinds of celestial matter had to be postulated. As we saw in chapter 3, 1.2.2., this view is attributed by Maimonides to al-Fārābī himself in his *Physics* commentary.

[100] Ibn Sīnā (2005, 307 ff., 317,3).

[101] It is still unclear to me, however, whether the kinematic models or hypotheses, as they are often called (i.e., the eccentrics and epicycles), would stand as *limmī* proofs of motion in an astronomical context. It would perhaps be more precise to say that the eccentrics and epicycles are causes of motion only if they are defined as corporeal entities made of aether or some other celestial substance, and thus that they stand as proofs only insofar as astronomy overlaps on celestial physics or shares some of its principles. But if these same devices are conceived of in purely abstract or geometric

Given the foregoing, al-Fārābī's works represent an important link in the scholarly effort to reconstruct a history of Arabic celestial kinematics, and this even though he did not articulate an explicit and detailed theory of celestial motion. Be it only for the conceptual questions that his works raise and for the fascinating yet tantalizing hints he provides, the Second Teacher's views on the topic deserved an extensive treatment. The fact that al-Fārābī juxtaposes physical orbs and spheres, celestial souls, and intellects, generates a number of problems, a central one being the causality of celestial motion and the way in which it may be studied from an epistemological perspective. While al-Fārābī may not have been aware of all the various issues and tensions underlying his cosmological account and discussed in the previous analysis, it had the merit of stimulating Ibn Sīnā to further reflect on them and find more sophisticated and convincing solutions. Retrospectively, one may say that the *falāsifah* played an important role in the history of medieval cosmology in general and of Arabic cosmology in particular, for they developed their own approach to defining the relation between astronomy and the other philosophical disciplines. In that sense, they stand at a crucial stage between the cosmological developments of late antiquity and the golden age of the post-classical *hayʾah* tradition.

4. *Conclusion*

This chapter provided a hypothetical reconstruction of al-Fārābī's views on celestial kinematics by relying on the sparse evidence in the Second Teacher's corpus as well as on the reports of later thinkers. Certain key issues, such as the causes underlying celestial motion, the relation between the separate intellects, the celestial soul, and the celestial body, and how the transition from abstract contemplation to corporeal motion is achieved, were examined in light of the Greek and Arabic sources. It emerged from the analysis that al-Fārābī's celestial kinematics, like the other fundamental doctrines of his cosmology, are characterized by a complex and subtle synthesis of various intellectual

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terms, then their causal efficacy would be eliminated by the same token, as only the formal cause would remain. Hence, the question of the explanatory status of these planetary hypotheses would hinge on how a thinker defines astronomy and its relation to physics and whether he defines the eccentrics and epicycles as bodies or as geometric figures. But even then, the implications of this point in the works of individual authors remain obscure and require further research.

traditions. In comparison to al-Kindī, who did not provide any compelling explanation of heavenly motion, and who regarded it merely as a sign of the heavens' obedience to God,[102] al-Fārābī is the first thinker to introduce some of the key kinematic concepts that were later elaborated by Ibn Sīnā, al-Ṭūsī, and others. Perhaps the most noteworthy feature of his works in this respect is their attempt to harmoniously integrate astronomical material within a physical and metaphysical framework, an endeavour which not only perpetuated a well-defined late antique trend in the Islamic context, but in addition influenced generations of subsequent Arabic thinkers who flourished after al-Fārābī.

[102] Adamson (2007a, 182–183).

CONCLUSION

The aim of this study was to analyze some of the key concepts of al-Fārābī's cosmology and to reconstruct the various stages of his philosophical development in light of the Greek and Arabic sources and the early Islamic intellectual milieu in which he flourished. Al-Fārābī's approach to cosmology can be defined chiefly in terms of the complex exegetical method he elaborated and his creative use of the late antique Greek and early Arabic sources. This approach, however, underwent various stages, which the study endeavoured to reconstruct, and which can be broadly divided into two periods: an 'early Baghdad phase,' characterized chiefly by al-Fārābī's endorsement of a creationist paradigm, and a 'late Baghdad and wandering phase,' which corresponds chronologically to the last ten years or so of his life, and which witnessed the development of al-Fārābī's mature cosmological theories. Both phases were marked by an interpretation of Aristotelian cosmology in light of late antique philosophical material and the *Neoplatonica arabica*, whose contents were nevertheless construed in a different way. This developmentalist hypothesis relies on substantial doctrinal evidence, and it also has the merit of including the few certain biographical facts in our possession. It enables a new organization of part of the Fārābīan corpus and a reassessment of many works of uncertain authenticity.

The study emphasized the crucial role that late antique Greek commentaries played in shaping al-Fārābī's cosmological project, which in many ways can be regarded as a continuation of this intellectual tradition. Through extensive terminological and doctrinal analysis, the study confirmed the importance of several works already identified by previous scholars and discussed other philosophical and astronomical sources liable to have influenced al-Fārābī's cosmological outlook, notably by Alexander, Simplicius, Geminus, Themistius, Proclus, and Syrianus. In addition, the analysis provided several case studies of how al-Fārābī's theories relate to those of Proclus and the *Proclus arabus*, and it showed that his particular interpretation of these sources should be regarded as a crucial factor underlying the development of his cosmology. The Proclean legacy in particular provided al-Fārābī with the conceptual means to elaborate a new cosmological paradigm grounded

in the concepts of eternal causation and intellection. In the process, the concepts of emanationism and divine creationism were re-examined in light of al-Fārābī's theories of eternal causality. Finally, in trying to provide a seamless cosmological model that integrates Aristotelian and Neoplatonic physics and metaphysics and Ptolemaic astronomy, it appears that al-Fārābī was continuing a practice already discernible in the works of Ammonius, Simplicius, and other Neoplatonists. In so doing, he was also elaborating a clear and systematic synthesis of the philosophical knowledge available in his time, which was used as a model by later Arabic thinkers.

With regard to certain specific cosmological doctrines, al-Fārābī must be credited with remarkable exegetical resourcefulness and creativity and for developing interpretations of ancient cosmological problems which, while they clearly draw on late antique sources, appear innovative in the early Islamic context. This is the case notably with his theories of the causation of the separate intellects and its relation to celestial intellection, the concept of celestial substance, and to a lesser extent his views on celestial motion—which require a greater degree of hypothesizing. Al-Fārābī's theory of the separate intellects marks an important shift in early Arabic thought, both because it introduces explicitly for the first time an entire hierarchy of intellectual beings between God and the corporeal world, and second, because the corollary theories of the causative powers of these intellects and their autonomy as demiurges constitute a new metaphysical paradigm, which departs clearly from the prevalent Islamic views on creation. This metaphysical elaboration significantly complexifies al-Fārābī's position vis-à-vis the mainstream Islamic beliefs of his time and defines him in many ways as a continuator of late antique pagan metaphysics.

Finally, al-Fārābī's eagerness to adapt his philosophical outlook to incoming influences and ideas is visible also with regard to his method, which reflects a special awareness of the scientific developments that took place in early Islamic society and that set new epistemological standards for subsequent Arabic thinkers. He is one of the first *falāsifah*, together with al-Kindī, to develop a genuine interest in the method of the particular sciences, such as mathematical astronomy and music, but in addition he develops a complex epistemic scheme grounded in the notions of the cooperation and subordination of the sciences, which also makes ample use of a range of philosophical techniques, such as experience, observation, and analogy.

The result of this study should lead to a partial reassessment of al-Fārābī's intellectual legacy in Islam. On the one hand, al-Fārābī's introduction of a level of intellectual beings between God and the corporeal world and his multi-layered theory of eternal causation, as well as his attempt at harmonizing physics, metaphysics, and astronomy both in terms of methodology and doctrine, had a profound impact on subsequent Arabic thought. This can be seen by comparing his cosmology to that of al-Kirmānī, Ibn Sīnā, and others. But on the other hand, this model, and especially al-Fārābī's idiosyncratic theory of the *thawānī* and their causative powers, was never wholly embraced by subsequent thinkers. One may say that, like a musical pattern, it served as a model for future variations on the same theme, but it was to my knowledge never reproduced in its details.[1]

This fact can be partly explained by al-Fārābī's highly particular interpretation of the separate intellects and their causal role, which would have seemed philosophically unacceptable or religiously provocative to later thinkers, including Ibn Sīnā, whose own doctrine of secondary causation differs considerably from that of his predecessor. This might also explain to some extent why al-Fārābī's mature metaphysics and cosmology do not seem to have had a strong impact on his immediate followers. In that sense, while solidly grounded in late antique sources, his cosmology and metaphysics are essentially unique and should be regarded as the product of a particular time and philosophical culture, a view emphasized by the historical perspective advocated in this book.

[1] In this regard, this study may also contribute to rectifying the misconception that al-Fārābī's cosmology was borrowed almost wholesale by Ibn Sīnā. Not only did the two thinkers disagree on the fundamental questions of the number of separate intellects and on their mode of causation, but they in addition probably articulated very different interpretations of celestial motion. Hence, the cosmological divergences between their models are at least as significant as the similarities, if not more so, a fact which has not been sufficiently acknowledged in the secondary literature and which is bound to modify to some extent our perception of al-Fārābī's philosophical legacy. The influence of al-Fārābī's theories of celestial intellection, causation, and motion on thinkers other than Ibn Sīnā, and especially on the Baghdad philosophical school of the tenth century, is still unclear. Further research on this important question seems a requisite to fully appreciate the fate that al-Fārābī's new cosmological and metaphysical model had in subsequent Arabic intellectual history.

APPENDIX ONE

COSMOLOGY AND THE AUTHORSHIP OF *TAʿLĪQĀT*, *ʿUYŪN*, AND *DAʿĀWĀ*

Introduction

Taʿlīqāt, *ʿUyūn*, and *Daʿāwā* are treatises ascribed to al-Fārābī in the Arabic tradition, but to this day these attributions remain uncertain. One reason to study these texts is that they contain interesting and sometimes original cosmological theories, which are in many ways akin to those of al-Fārābī and Ibn Sīnā, but which have not been examined critically before. Only a detailed examination of the contents of these works will enable the question of their authorship to be definitively settled. In what follows, I offer a comparative analysis of certain key cosmological themes with the hope that it will shed some light on this issue and contribute to future research on these works.[1]

1. *The Nature and Causation of the Celestial Substance*

Taʿlīqāt

As its name indicates, this is a somewhat random collection of notes on various philosophical issues, although it displays a clear interest in cosmology and in the motion and contemplation of the celestial bodies in particular. With regard to the subject of celestial substance, however, the author says relatively little. He explains that the orbs and planets are composite and possess a hylomorphic constitution: *fīhā tarkīb min māddah wa-ṣūrah*.[2] In spite of this, the celestial bodies are the noblest of "material things" (*al-māddiyyāt*).[3]

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[1] While *Daʿāwā* has to my knowledge never been studied before, the problem of the authenticity of *Taʿlīqāt* and *ʿUyūn* has attracted some scholarly attention. With regard to the former, Michot (1982) questioned its authenticity, but Āl Yāsīn, who provided a new Arabic edition of this work in 1988, attributed it to al-Fārābī; cf. Vallat (2004, 387), who leaves the question of its authenticity open. As for *ʿUyūn*, Goichon (1937, 226 ff.), Cruz Hernández (1950–51), Alonso Alonso (1959), and more recently Lameer (1994, 23–25), take it to be a genuine Fārābīan work. Serra (1993, 51) rejects al-Fārābī's authorship and ascribes it to Ibn Sīnā's circle, while Vallat (2004, 383) classifies it as a genuine work but remains skeptical. In any case, this work has been studied mostly from a Latinist perspective as a result of its transmission to medieval Europe and little effort has been exerted to contextualize it in the classical Islamic period. All the subsequent translations from the Arabic texts are my own.

[2] Al-Fārābī (1992, sec. 27, 383).

[3] Al-Fārābī (1992, sec. 2, 372).

In addition, he says that the forms of the celestial bodies are "fixed in their matters" (*mawqūfah ʿalā mawāddihā*).[4] On the other hand, the author says nothing about the causation of the celestial bodies. These brief remarks suffice to show the gap between this work and al-Fārābī's emanationist treatises, since the latter do not describe the celestial bodies as hylomorphic beings and omit the term *māddah*.

Daʿāwā

In *Daʿāwā*, one finds a wealth of comments on the celestial bodies, a fact which testifies to the author's interest in cosmology.[5] *Daʿāwā* puts forth a cosmological model based on the concept of emanation that closely resembles both al-Fārābī's and Ibn Sīnā's emanationist schemes. More specifically, the process through which the heavenly bodies are produced is reminiscent of their metaphysics: it is the separate intellects, which, by contemplating their essence and God, cause a lower separate intellect and a heavenly body to exist. The author writes:

> and it [i.e., the first separate intellect caused by God] is also one and free of multiplicity, except in the sense [previously] mentioned. From it is produced the highest heaven [i.e., the outermost orb] and *its matter and form, which is its soul*, insofar as it [the intellect] is possible of existence and contemplating its own essence. And from this second [i.e., the first separate intellect after God] is produced another intellect.[6]

What is immediately noticeable in this passage is the technical vocabulary used to describe the separate intellects, a vocabulary which is found throughout the treatise and which is usually associated with Ibn Sīnā and his circle. This is obvious, for instance, from the author's extensive use of such terms as "necessary of existence" (*wājib al-wujūd*) and "possible of existence" (*mumkin al-wujūd*).[7] For our purpose, however, the most important feature of this excerpt consists in the reference to the composition of the celestial orb. The outermost orb, which is produced by the intellection of the first emanated being, is composed of form (*ṣūrah*) and matter (*māddah*). The reference to heavenly matter reappears in another passage, where the author explains that

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[4] Al-Fārābī (1992, sec. 95, 400). This use of the plural form of the term *māddah* raises several questions. Is the author implying that the heavenly bodies possess different types or degrees of matter? Or that the heavens as a whole are composed of various different elements? No definitive answer can be given on the basis of these laconic statements.

[5] The treatise, however, opens with these words: *al-daʿāwā l-qalbiyyah al-mansūbah ilā Arisṭū mujarradah ʿan al-ḥujaj li-Abī Naṣr al-Fārābī* (al-Fārābī 1930, 2). This raises the question of how medieval thinkers perceived the authorship of this treatise.

[6] Al-Fārābī (1930, 4–5): *wa-huwa ayḍan wāḥid lā kathrata fīhi illā ʿalā l-wajh al-madhkūr wa-yūjadu ʿanhu min ḥaythu huwa mumkin al-wujūd ʿāqil li-dhātihī l-falak al-aʿlā bi-māddatihī wa-ṣūratihī allatī hiya nafsuhū wa-innahū yūjadu ʿan hādhā l-thānī ʿaql ākhar*.

[7] Al-Fārābī (1930, 2–4, and passim).

the heavenly bodies cannot have the same matter as sublunary elements, nor can they have the same form, or else they would be perishable. Hence, they possess an essentially different kind of matter, which represents a "fifth nature" (*ṭabīʿah khāmisah*),[8] a formula which relies on Aristotle's theory of aether as expounded in *On the Heavens*. Hence, *Daʿāwā* ascribes a hylomorphic constitution to the heavens and refers explicitly to its matter (*māddah*) in a manner congruent with *Taʿlīqāt*.

ʿUyūn

This treatise shares *Taʿlīqāt*'s and *Daʿāwā*'s views on celestial substance. The celestial bodies are described as hylomorphic beings that consist of form and matter, the former principle being equated with soul. In addition, and as in *Daʿāwā*, the author of *ʿUyūn* explains that both the celestial form and matter are different from their sublunary counterpart and represent a "fifth nature" (*ṭabʿ khāmis*).[9] The cause responsible for this form and matter is a separate intellect. It is noteworthy that the intellects produce both the form and matter of the orbs by intellecting their own essence. Thus, one cause is given to account for the dual principles of form and matter, a view also found in al-Fārābī's cosmological treatises.

This brief overview shows that *Taʿlīqāt*, *Daʿāwā*, and *ʿUyūn* present an overlapping theory of celestial substance. These three works stress the hylomorphic composition of the celestial bodies and repeatedly refer to the celestial matter (*māddah*), which they explicitly define as a 'fifth nature,' while none of them mentions the concept of celestial substrate (*mawḍūʿ*). These views show a marked similarity to Ibn Sīnā's doctrine of celestial substance, but they are on the other hand irreconcilable with al-Fārābī's emanationist treatises.

2. *Intellection and Imagination*

Taʿlīqāt

The following paragraphs provide an overview of several topics, especially celestial intellection and imagination, the relation between human and celestial imagination, and the impact of the latter on the sublunary world. Like *Ārāʾ* and *Siyāsah*, *Taʿlīqāt* describes the heavenly bodies as ensouled beings that possess rational thought. The celestial bodies are composed of form and matter, the former principle being identified with their soul (*nafs*) or intellect (*ʿaql*), while the latter principle introduces an element of multiplicity that makes the heavenly souls deficient and imperfect compared to the separate intellects and the First.[10] These souls, and the heavens as a whole, strive to

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[8] Al-Fārābī (1930, 8).

[9] Al-Fārābī (1999a, 60–62).

[10] As in *Ārāʾ* and *Siyāsah*, the two terms *nafs* and *ʿaql* are used interchangeably to refer to the celestial souls; see al-Fārābī (1992, sec. 27, 382–383; sec. 73, 393).

attain their highest perfection by contemplating God, the noblest object of thought.[11] The circular motion of the heavens results from this intellection and from the orbs' desire to imitate the higher principles. Apart from the celestial souls, there are also "efficient intellects" (*al-ʿuqūl al-faʿʿālah*), which differ from the heavenly souls by having simple and completely immaterial essences.[12]

Up to now, the cosmological picture that emerges from *Taʿlīqāt* contains a First Cause, separate intellects, and heavenly souls, and it thus bears a marked resemblance to al-Fārābī's works. However, the author of *Taʿlīqāt* seems to have been preoccupied by issues that did not interest al-Fārābī much. It was noted before that al-Fārābī provides little information about the nature of the intellection of the celestial souls, for example, whether their intellection is discursive or non-discursive, how it differs from the intellection of the separate intellects, and whether it is potential or actual. *Taʿlīqāt*, on the other hand, provides more insight into these noetical issues. One reads that the "intellects of the planets are in potency, not in actuality, and contemplate [things] not all at once, but rather one thing after another."[13] According to the author, then, the thought of the celestial bodies is discursive, which means that it moves from one object of thought to another, because it cannot encompass all the intelligibles at once. This creates a notion of multiplicity that makes the heavenly souls deficient, for as the author writes, "wherever there is plurality, there is deficiency."[14] Moreover, the celestial souls are potential. Whether this potency is due to the discursive nature of the celestial souls' thought or to their composite hylomorphic nature is not specified. In any case, this view goes against the more common Aristotelian idea that everything above the orb of the moon is in a perpetual state of actuality.

It is notable that the themes discussed in *Taʿlīqāt*, such as the notions of discursive thought vs. non-discursive thought and potency vs. actuality, also figure prominently in the *Neoplatonica arabica*. But these works provide different answers to these problems. In *Theology of Aristotle*, for example, discursive thought is associated with actuality, and non-discursive thought (a higher intellective mode) with potency. Hence, potency is considered to be more perfect than actuality. As the Adaptor writes, potency "manifests and perfects activity."[15] In contrast, *Taʿlīqāt* associates discursive thought with potency, not actuality. This potency is described as a source of imperfection and deficiency in the heavenly bodies. The two works therefore adopt a different view on the potency-actuality question. Whereas potency corresponds to a higher form of (non-discursive) intellection for the Adaptor, it entails discursiveness, plurality, and deficiency for the author of *Taʿlīqāt*.[16]

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[11] Al-Fārābī (1992, sec. 43–44, 386–387, sec. 56, 389, and sec. 63, 391).

[12] Al-Fārābī (1992, sec. 27, 382–383).

[13] Al-Fārābī (1992, sec. 27, 382–383): *ʿuqūl al-kawākib bi-l-quwwah lā bi-l-fiʿl fa-laysa lahā an taʿqila dafʿatan bal shayʾan baʿda shayʾin*.

[14] Al-Fārābī (1992, sec. 27, 382–383).

[15] Badawī (1977b, 101), Lewis (1959, 75), and Adamson (2002a, 94 ff.).

[16] Again, this might be explained by the fact that *quwwah* in the *Neoplatonica arabica* often refers to 'power' and not to 'potentiality' in the Aristotelian sense.

Al-Fārābī would have disagreed with many of the ideas developed in *Taʿlīqāt*. As we have seen, he considers that the heavenly souls have non-discursive thought, since their intellection occurs "all at once" (*dafʿatan*). Al-Fārābī would also have rejected the notion that they are affected by potency; according to him, they are eternally in actuality, and actuality is a higher principle than potency. Their only deficiency derives from the plurality of their intellection, which introduces complexity in their essence and sets them apart from the First (who is absolutely simple) and the intellects (which have a lesser degree of complexity). Unlike the author of *Taʿlīqāt*, then, al-Fārābī combines non-discursive thought with actuality in his theory of celestial intellection. Another significant difference between *Taʿlīqāt* and al-Fārābī's emanationist works concerns the number of the contemplated objects. Whereas the heavenly souls in *Ārāʾ* and *Siyāsah* are said to have three objects of thought (God, the separate intellects, and their own essence), those of *Taʿlīqāt* seem to limit their contemplation solely to the First. This appears clearly in section 56, which states that the "heavens and stars contemplate the First," and in section 58, when the author notes that it is sufficient to posit a single mover to explain the various heavenly motions.[17]

One of the fundamental cosmological doctrines of *Taʿlīqāt* is the ascription of imagination to the celestial bodies. Whereas al-Fārābī explicitly asserts in his emanationist works that the souls are devoid of the faculty of imagination, *Taʿlīqāt* devotes several paragraphs to this topic and its implications for the celestial and sublunary realms.[18] It defines imagination as an essential aspect of the activity and knowledge of the heavenly souls. According to the author, the souls "first intellect things and then imagine them."[19] In humans, this pattern is inverted and intellection is said to follow imagination. The dual nature of celestial thought (intellection and imagination), and especially the fact that imagination is said to follow intellection, are intriguing ideas, which may have their origin in some passages of the *Neoplatonica arabica*, but which I was not able to identify with any precision.

But what is the benefit of having celestial souls that possess imagination in addition to intellection? The answer to this question lies in the special powers conferred to the heavenly bodies as a result of their imagination. The peculiarity of *Taʿlīqāt* in this respect is that heavenly imagination acquires a demiurgic quality that intellection alone does not have. Thanks to their imagination, the heavenly bodies become key agents and causes in the generation of beings in the sublunary world. The author writes: "the planets imagine things, and their imagination becomes a cause for the creation of things." For example, when the heavenly bodies imagine heat in the air, then heat is produced in the air.[20]

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[17] Al-Fārābī (1992, sec. 56, 389): *al-falak wa-l-kawākib taʿqilu l-awwal*, and section 58, 389–390: *wa-yakfī fīhā muḥarrik wāḥid*.

[18] See in particular al-Fārābī (1992, sec. 55, 389 and sec. 78, 395–396).

[19] Al-Fārābī (1992, sec. 55, 389): *al-falak yaʿqilu hādhihī l-ashyāʾ thumma yatakhayyaluhā*.

[20] Al-Fārābī (1992, sec. 78, 395–396): *al-kawākib tatakhayyalu l-ashyāʾ, fa-yaṣīru takhayyuluhā sababan li-ḥudūth ashyāʾ*.

Furthermore, the author explains that the creation that occurs through the celestial bodies' imagination is different from the one that results from their motion: "their imagination can become a cause for the production of things, just as their motions are a cause for the production of other things." And shortly after, he adds that "they [the celestial bodies] can imagine [something] and create this thing either without the mediation of motion or with the mediation of motion."[21] The celestial bodies have, therefore, a dual demiurgic power that can be expressed either through motion or through imagination. The idea that the movements of the heavenly bodies have a direct influence on sublunary beings harkens back to Aristotle, according to whom the sun is an efficient cause that plays a crucial role in sublunary generation and corruption.[22] Many subsequent thinkers, including al-Kindī and al-Fārābī, generalized this principle and made all the celestial bodies causes of change in the sublunary world. But the claim that celestial imagination itself is endowed with a causal efficacy that operates in isolation from heavenly motion appears unprecedented and testifies to the original reworking of cosmological ideas achieved by the author of *Taʿlīqāt*.

Even more striking is the author's assertion that the imagination of the heavenly bodies is a cause for the generation of "imaginables" (*takhayyulāt*) in the human soul.[23] This means that the heavenly bodies' imagination can act on human reflection in addition to natural phenomena. This theory establishes a direct epistemological link between the human and heavenly souls, a role which is traditionally reserved in Arabic philosophy for the Agent Intellect. Here it appears that the heavenly souls have partially appropriated the role played by the Agent Intellect as an agent of human thought, although they presumably act primarily on the human imaginative faculty, whereas the Agent Intellect is responsible for actualizing the intelligibles in the human mind.[24] This significant development suggests that the psychology and epistemology elaborated by the author of *Taʿlīqāt* bears some connection to Ibn Sīnā's philosophy, which also includes a theory of celestial imagination and of its impact on human thought.[25]

One cannot refrain from comparing the theory of imagination put forth in *Taʿlīqāt* to al-Fārābī's theory of human imagination. It is well known that this concept plays a key role in al-Fārābī's epistemology, psychology, and prophetology. Among other things, imagination is what enables the prophet to transform intelligibles and demonstrative knowledge into a metaphorical language accessible to the masses. However, the differences between these theories seem

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[21] Al-Fārābī (1992, sec. 78, 395–396): *fa-yaṣīru takhayyuluhā sababan li-ḥudūth ashyāʾ kamā anna ḥarakātahā takūn sababan li-ḥudūth ashyāʾ ukhar*. And: *wa-qad tatakhayyalu fa-tuḥdithu shayʾan lā bi-tawassuṭ al-ḥarakah, aw maʿa tawassuṭ al-ḥarakah*.

[22] See *On Generation* 2.10.

[23] Al-Fārābī (1992, sec. 78, 395–396).

[24] The author does mention the Agent Intellect in another passage dealing with human noetics; al-Fārābī (1992, sec. 78, 395–396).

[25] Cf. Michot (1986) and Gutas (2006a and 2006b) on Ibn Sīnā's theory of celestial imagination and its epistemological role.

greater than their similarities. In al-Fārābī's philosophy, the Agent Intellect is the only superlunary entity that can act directly on human reflection; the other heavenly bodies are not instrumental in this process. At any rate, al-Fārābī himself says nothing about it. The Agent Intellect is responsible for transmitting intelligibles (*maʿqūlāt*), not imaginables (*takhayyulāt*), to the human rational soul. As a corollary, imagination is a faculty developed only in humans and has no place in the heavens. In comparison, what is particularly compelling about the account in *Taʿlīqāt* is that it provides a link between human and celestial imagination, arguing that the imagination of the celestial bodies is directly responsible for the 'imaginables' in the human mind.

This brief analysis shows that the theory of celestial intellection developed in *Taʿlīqāt* is significantly different from the one that can be found in al-Fārābī's *Ārāʾ* and *Siyāsah*, or, for that matter, in the rest of the Fārābian corpus. In particular, the ascription of imagination to the heavenly bodies and the emphasis on its causative power, as well as the primacy of potency over actuality, constitute sufficient grounds for rejecting the attribution of this treatise to al-Fārābī. On the other hand, the theories developed in *Taʿlīqāt* are reminiscent of Ibn Sīnā's cosmology, so that Y. Michot may be correct in attaching this work to the Avicennan corpus.[26] This being said, its doctrines do not completely overlap with the Avicennan works. Ibn Sīnā upholds the theory of celestial imagination, but he does not overtly ascribe such pervasive causative powers to the imaginative faculty of the celestial beings. For this reason, it would perhaps be precocious to attribute this version of *Taʿlīqāt* to Ibn Sīnā himself, since it could very well have been composed by one of his disciples or a member of his extended circle. Only future research will be able to settle this question decisively.

ʿUyūn

That the author of *ʿUyūn* was also interested in cosmology is reflected in his protracted discussions of various key issues, especially the causation and motion of the celestial bodies and their influence on the sublunary world. It would not be an exaggeration to describe *ʿUyūn* as a cosmological-metaphysical treatise, which also contains interesting digressions on other physical and psychological topics. Like al-Fārābī and the author of *Taʿlīqāt*, the author of *ʿUyūn* takes it for granted that the celestial bodies are ensouled beings that possess intellection as their principal activity and rotate in a perfect circular motion. Moreover, in sections 7 and 8, the creation of the orbs is explained in the same manner as in the other treatises examined thus far: it is the intellection of the separate intellects that causes the existence of the orbs and the other lower intellects. It is notable, however, that the author of *ʿUyūn* does not indicate the total number of separate intellects and orbs; he claims not to be able to answer this question precisely, but only in a general manner (*ʿalā ṭarīq al-jumlah*).[27]

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[26] Michot (1982).

[27] Al-Fārābī (1999a, sec. 9, 58–59).

There are several other features in *ʿUyūn* that deserve attention. First, it is notable that the separate intellects possess a twofold intellection, which is described using Avicennan metaphysical terminology. The author writes: "Multiplicity is produced in the first created being (*al-mubdaʿ al-awwal*) accidentally, because it is possible of existence in itself and necessary of existence through the First, because it knows its essence and it knows the First."[28] Again in section 8, it is said that "another intellect is produced by the first intellect as a result of its being necessary of existence and cognizant of the First … and the first intellect in its being possible of existence and cognizant of its own essence produces the highest orb with its matter and form, which is its soul."[29] Several features connect these passages to al-Fārābī's cosmology, such as the fact that only one cause is responsible for the form *and* matter of the orbs. This corresponds precisely to al-Fārābī's account in *Ārāʾ* and *Siyāsah*, where by thinking about God, the first separate intellect produces the second intellect, and by thinking its own essence, it produces both the immaterial and corporeal components of the first heaven.[30] On the other hand, it differs from Ibn Sīnā's triadic theory, which posits a cause for each one of these principles, one for intellect, one for matter, and one for form. Like al-Fārābī's treatises, *ʿUyūn* explains that the twofold intellection of the separate intellects results in their having multiplicity (*kathrah*), albeit by accident (*bi-l-ʿaraḍ*).[31]

Second, the *ʿUyūn* provides interesting information about the nature of the souls' cognitive faculties. In the first place, the celestial bodies are said to have knowledge of both universals and particulars: *wa-li-l-ajrām al-samāwāt maʿlūmāt kulliyyah wa-maʿlūmāt juzʾiyyah*. It is then specified that this dual knowledge entails that the celestial bodies undergo a kind of change or transition (*intiqāl*), since they must pass from one cognitive state to another, from the particular to the universal or more likely from one particular object to another. This transition occurs through or "by way of imagination" (*ʿalā sabīl al-takhayyul*). Furthermore, this intellectual imagination produces a corporeal imagination (*al-takhayyul al-jismānī*), which is defined as the cause of celestial motion, itself a cause of sublunary change.[32] These ideas are quite original and find no parallel in the other Arabic cosmological texts analyzed thus far, although the digression on celestial imagination fits well in the context of Avicennan cosmology.

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[28] Al-Fārābī (1999a, sec. 7, 58).

[29] Al-Fārābī (1999a, sec. 8, 59).

[30] Al-Fārābī (1985a, 100–101 and 1985b, 61).

[31] Al-Fārābī (1999a, sec. 7, 58). It is possible that the author intended this treatise to be a condensed account or summary of his cosmology, in which case he would not have bothered to explain the intellection and causation of the superlunary beings in detail. In that sense, the theory of twolfold intellection upheld in *ʿUyūn* is not a sufficient reason to exclude the possibility of Ibn Sīnā's authorship or that it was composed in the Avicennan circle. The Avicennan connection seems further supported by the particular terminology used in this work, such as "possible" and "necessary of existence," etc.

[32] Al-Fārābī (1999a, sec. 10, 59–60).

This section of *ʿUyūn*, which contains most of the information on the souls' knowledge, is condensed and leaves many questions unanswered. For example, the mention of a transition (*intiqāl*) with respect to the celestial beings' intellection is problematic, because it would seem to imply potency, a fact that is not accounted for by the author. Moreover, knowledge of particulars suggests a discursive mode of thought, whereas knowledge of universals could be non-discursive. No clarifications are given concerning this point either. It should be stressed that the author of *Taʿlīqāt* in contrast addresses these issues expressly and defines the celestial bodies' thought as discursive and potential.[33] Since *ʿUyūn* attributes particular objects of thought to the celestial bodies, one assumes that their intellection is also discursive and affected by potentiality. Finally, no precise information is given in *ʿUyūn* concerning the universal objects intellected by the celestial souls. Although these intelligibles may consist of the separate intellects or the First, they could just as well be the universal principles of sciences or Platonic ideas like 'human' or 'horse.' The author's lack of precision on this point contrasts with the accounts of al-Fārābī and Ibn Sīnā, which clearly identify the objects of the celestial souls' intellection. It also deviates from *Taʿlīqāt*, which specifies that "the orbs and planets intellect the First."[34]

From the overview provided above, it appears that *ʿUyūn* and *Taʿlīqāt* share several cosmological doctrines, but also develop unique theories. For example, like *Taʿlīqāt*, *ʿUyūn* ascribes imagination to the celestial souls. In *ʿUyūn*, however, this imagination is not described so much as a faculty that can be clearly distinguished from rational thought, as a process of transition between two cognitive states; it is the means (*ṭarīq*) between two kinds of thought, the universal and particular. Imagination fulfills no such function in *Taʿlīqāt*, although the assertion that "the [souls of the] orbs think these things [particulars?], and then imagine them"[35] definitely indicates a change or transition as well. In any case, *Taʿlīqāt* distinguishes imagination from intellection and clearly presents them as two different faculties. The theory of imagination as a demiurgic power, which is fully developed in *Taʿlīqāt*, finds no counterpart in *ʿUyūn*. Whereas *Taʿlīqāt* stresses the direct impact of celestial imagination on sublunary things and on human thought, *ʿUyūn* describes this imagination merely as one of the principles underlying celestial motion.

The conclusion, then, is that although the celestial noetics in *Taʿlīqāt* and *ʿUyūn* overlaps to a certain extent, these treatises essentially present two different cosmologies. They discuss common themes, such as celestial imagination, but also contain substantial differences that likely point to a different authorship. Overall, it may be said that their contents are closer to Ibn Sīnā's cosmology than to that of al-Fārābī. From a cosmological perspective and on grounds of a doctrinal comparison, they should not be attributed to the Second Teacher and seem rather to belong to the Avicennan circle. This being said,

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[33] Al-Fārābī (1992, sec. 27, 382–383).
[34] Al-Fārābī (1992, sec. 56, 389).
[35] Al-Fārābī (1992, sec. 55, 389).

a closer examination between these works and Ibn Sīnā's cosmology is required in order to settle the question of their authorship in a definitive manner.

3. *Celestial Motion*

Taʿlīqāt

Taʿlīqāt provides a particular account of celestial motion that focuses not only on the contemplation of the heavenly intellects, but also on their will (*irādah*) and imagination (*takhayyul*). The author writes that "the orb[s] and planets contemplate the First Principle, such that this intellection generates pleasure and that motion follows out of this pleasure." In addition, one reads that the "orb[s] conceive of the end along with their motions."[36] These passages indicate that it is the intellection and mental conception of the heavenly bodies that causes their motion, although this is not achieved directly, but through the intermediary of pleasure (*iltidhādh*). This notion, which recalls Aristotle's comments in Book Lambda 7 on the pleasure that accompanies contemplation, is here defined as an intermediary stage in the process leading to heavenly motion. Motion is not the cause of pleasure or even synchronic with the pleasure that results from the intellection of the celestial souls; rather, motion is an outcome of their pleasure and blissful state.

In another passage, we read that "the cause of the constant circular motions [of the orbs] is their constant [acts of] willing, for which it is sufficient to posit only one mover that acts through love."[37] Mention of the celestial will is reiterated in section 63, together with the concept of *imitatio dei*: "the will of [each] orb and planet is to perfect itself and imitate the One."[38] Here it is will rather than intellection proper that is described as the main cause of motion, but these two concepts are not in any way opposed and usually go hand in hand in Arabic cosmology, as can be seen in the case of Ibn Sīnā.[39] The clarity and forcefulness with which these ideas are articulated greatly contrast with the fragmentary and ambiguous information provided by al-Fārābī's treatises. Although the views exposed in *Taʿlīqāt* are by no means incompatible with these treatises, al-Fārābī does not elaborate on the concepts of pleasure and volition in his account of celestial kinematics.

On the other hand, *Taʿlīqāt* also establishes a connection between motion and imagination, an idea which is completely absent in al-Fārābī's cosmology, since the Second Teacher rejects the existence of this celestial faculty. As we

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[36] Al-Fārābī (1992, sec. 56, 389): *al-falak wa-l-kawākib taʿqilu l-awwal, fa-yastafizzuhā l-iltidhādh bi-hādhā l-taʿaqqul fa-tatbaʿuhū l-ḥarakah*, and: *al-falak yataṣawwaru l-ghāyah maʿa tilka l-ḥarakāt*.

[37] Al-Fārābī (1992, sec. 58, 389–390): *ittiṣāl al-ḥarakāt al-mustadīrah sababuhū l-irādāt al-muttaṣilah, wa-yakfī fīhā muḥarrik wāḥid ʿalā sabīl al-ʿishq*.

[38] Al-Fārābī (1992, sec. 63, 391): *irādat al-falak wa-l-kawākib an tustakmala wa-tatashabbaha bi-l-awwal*.

[39] Ibn Sīnā (2005, 312,20 ff.) and Janos (2011).

have seen before, *Taʿlīqāt* states that the heavenly bodies possess intellects in potency, not in actuality, which means that their intellection is discursive and must progress from one object to another. Closely linked to this idea is the author's claim that the celestial bodies can only "imagine [*takhayyala*] their individual motions one at a time and not all at once." Hence, the imagination of the celestial bodies is subjected to the same limitation and follows the same pattern as their intellection. "If that were not the case," the author continues, "then the planets would be able to perform the movements all at once, but this is impossible."[40] What is noteworthy in these passages is not the fact that the author ascribes imagination to the heavenly bodies—for as should be clear by now, this is typical of works composed in Ibn Sīnā's circle—but rather that he seems to make imagination the primary principle or cause of heavenly motion. In other words, a motion that is imagined actually occurs, and this is why the planets cannot imagine all movements at once. Finally, it should be noted that *Taʿlīqāt* displays other interesting features about the heavens that do not find any parallel in al-Fārābī's works. These include the use of the term *shakhṣ/ashkhāṣ* to refer to the heavenly intellects and the strong connection between motion, imagination, and causation.[41]

ʿUyūn

Compared to *Taʿlīqāt*, *ʿUyūn* contains limited information on the causes of celestial motion, but the theories it develops are nevertheless worth examining. Like the other treatises under discussion, *ʿUyūn* describes heavenly motion as circular and regular and establishes a direct connection between the heavenly bodies' imagination and motion: the former is the cause of the latter. More specifically, however, motion occurs when the souls' "intellectual imagination" becomes a "corporeal imagination" (*al-takhayyul al-jismānī*). It is these particular, corporeal "imaginings" (*takhayyulāt*) that translate into the continuously renewed corporeal movements of the orbs. Furthermore, heavenly motion is a motion "in position" (*waḍʿiyyah*), which is opposed to the motion "in place" (*makāniyyah*) of the sublunary bodies.[42] It should be noted that the concept of motion "in position" is typically Avicennan and is not mentioned by al-Fārābī in the works attributed to him.[43] As in *Taʿlīqāt*, then, the concept of celestial motion in *ʿUyūn* is grounded chiefly in the concept of imagination. But here a further refinement and a special concept, "corporeal imagination," is introduced and defined as an intermediary stage between the souls' psychological activity and the physical motion of the orbs. This notion of corporeal imagination seems to be idiosyncratic to this treatise and does

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[40] Al-Fārābī (1992, sec. 27, 382–383): *wa-illā la-kānat tataḥarraku l-ḥarakāt kulluhā dafʿatan, wa-hādhā muḥāl.*

[41] Al-Fārābī (1992, sec. 65, 391; sec. 78, 395–396).

[42] Al-Fārābī (1999a, sec. 10–12, 60).

[43] For some insight into Ibn Sīnā's celestial dynamics and especially his concepts of motion and inclination, see Hasnaoui (1984).

not have any equivalent in the other Arabic cosmological works I have examined.

Apart from imagination, *ʿUyūn* contains other notable kinematic features. In section 13, the necessity of a First Unmoved Mover is introduced on the basis of the impossibility of an infinite regress of movers and things moved. This fundamentally Aristotelian argument shows that the author of *ʿUyūn* was familiar with *Physics* and the Greek tradition of natural philosophy. The existence of a First Unmoved Mover suggests, as in Aristotle's cosmological system, that planetary motion occurs as a result of the orbs' desire for the First Principle. Furthermore, the author follows the Arabic Peripatetics in making the souls desire other separate principles, which act as unmoved movers. This appears clearly when he writes that the motion of the orbs is "psychological, not natural [*nafsāniyyah lā ṭabīʿiyyah*], and is due not to appetite [*shahwah*] or irascibility [*ghaḍab*], but to their desire [*shawq*] to imitate the intellects separated from matter."[44]

If the celestial kinematics of *ʿUyūn* harkens back to Book Lambda and follows al-Fārābī's cosmology in some respects, it also differs from it in a number of ways. First, it is notable that the author distinguishes between appetite (*shahwah*) and desire or love (*shawq*). Al-Fārābī does not make this distinction, but it is well-known that Ibn Sīnā did.[45] The basic idea is to elevate the heavenly bodies beyond the passions of sublunary beings and stress their nobleness and rational nature. It is an intellectual form of love that they experience for the unmoved movers. Second, the opposition between natural and psychological motion is noteworthy. The author of *ʿUyūn* contrasts the purely psychological motion of the heavens with the natural motion of sublunary bodies. This connects with the definition of nature he provides as "the principle of motion and rest when these are not caused by an exterior thing or through will."[46] Al-Fārābī does not compare natural motion and spiritual motion in his works, except in *Ithbāt*, whose authenticity is questionable. The view put forth in *ʿUyūn* can in any case be attached more easily to Ibn Sīnā, who argues in many passages of his works that celestial motion is not natural and primarily caused by soul.[47]

The connection with Ibn Sīnā is further reinforced by a crucial concept that appears in *ʿUyūn*: *mayl* or inclination. To my knowledge, al-Fārābī does not mention this concept in any of his works. Having explained that the universe has a physical limit and a center and that void does not exist (these are well-known Aristotelian theses), the author then introduces the concept of natural inclination (*al-mayl al-ṭabīʿī*), which he contrasts to compulsive or forced inclination (*al-mayl al-qasrī*). The celestial orbs, he says, have "circular inclination by nature" (*wa-l-falak bi-ṭabʿihī al-mayl al-mustadīr*).[48] This means

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[44] Al-Fārābī (1999a, sec. 17, 62).

[45] Ibn Sīnā (2005, 312–313, 316).

[46] Al-Fārābī (1999a, sec. 13, 60). The Aristotelian theory of the natural motion of the four elements is also developed in section 12.

[47] See chapter 4, 2.1.

[48] Al-Fārābī (1999a, sec. 14, 61).

that unlike the sublunary bodies, which are characterized by rectilinear inclination and whose motions may be governed by compulsion, circular motion is free of any kind of compulsion.

Finally, the concept of imitation (*tashabbuh*) should be mentioned here, since it plays an important role in the Arabic tradition. Al-Fārābī does not elaborate on this concept in his works, although it probably underlies his general theory of celestial kinematics. On the other hand, it is discussed at length in the cosmology of such thinkers as Ibn Sīnā and Abū Sulaymān al-Sijistānī.[49] In *ʿUyūn*, *tashabbuh* is presented as the main activity and aim of the celestial bodies, which seek to attain the perfection of the higher immaterial principles through contemplation. The orbs desire and choose to contemplate the beauty of the separate intellects, and this contemplation is translated at the physical level into the eternal circular motions they perform.

As in many other cosmological adaptations derived from Aristotle's Book Lambda, the author of this treatise also addresses the question of the object of the souls' love. In this respect, the author writes that

> each celestial body has a special separate intellect that it desires to imitate, and it is not fitting that the love of the entire system be directed at one thing of a single genus. Rather, each celestial body has a special beloved that is different from the object of the other orbs.

This implies that each separate intellect acts as an unmoved mover for its respective orb. However, immediately after this statement, the author adds that "the totality (*al-kull*) shares a single object of love, which is "the first object of desire" (*al-maʿshūq al-awwal*)."[50] This dual thesis that the celestial bodies share a single and universal object of love (God), which is responsible for inspiring their continuous circular motion, and at the same time that each one possesses a specific separate mover, is typical of Ibn Sīnā's cosmology.[51]

To conclude, the celestial kinematics found in *ʿUyūn* constitutes an eclectic system made up of various theories mostly drawn from the Greek and Arabic Peripatetic tradition. Noteworthy are the theories of imagination and inclination, which are grafted on a basic Aristotelian cosmological scheme. Generally speaking, *ʿUyūn*'s theories of celestial motion are much closer to those of Ibn Sīnā than to those of al-Fārābī. In fact, several points suggest that the author was active in Ibn Sīnā's circle or that he was particularly influenced by the *shaykh al-raʾīs*. The recognizable Avicennan features include: the ascription of imagination to the celestial bodies; the distinction between *shahwah*, *ghaḍab*, and *shawq*; a clear articulation of *tashabbuh*; and the concept of *mayl*. When added to the Avicennan terminology used in this work ("necessary" and "possible of existence," etc.), the accumulated cosmological evidence definitely points to Ibn Sīnā or one of his disciples as the author of this treatise.

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[49] See for example Ibn Sīnā (2005, 315,15 ff.).

[50] Al-Fārābī (1999a, sec. 17, 62).

[51] See *Metaphysics* of *Shifāʾ* in Ibn Sīnā (2005, 323,20–26), chapter 4, 3.1-2 of this book, and Janos (2011).

Conclusion

ʿUyūn, *Taʿlīqāt*, and *Daʿāwā* contain cosmological ideas that are at odds with al-Fārābī's treatises. Whether with respect to celestial substance, intellection, imagination, or motion, these treatises generally elaborate theories that are absent from his works or contradict well-known Fārābīan positions, with only a few exceptions of doctrinal overlap. Why they became associated with his corpus at a certain point in time is a difficult question to answer, but one may hypothesize that the juxtaposition of cosmological treatises by al-Fārābī and Ibn Sīnā in the same compilations could have led to this confusion. The otherwise many structural parallels between their cosmological systems would no doubt have contributed to this phenomenon.

On the other hand, it is unclear how much of the material contained in these works should be ascribed to Ibn Sīnā himself. While there are numerous parallels between his cosmology and these treatises, there are also certain elaborations that may best be interpreted as later developments brought about by thinkers who were deeply imbued with his teaching. Whether these works belong to a particular period of Ibn Sīnā's output or were written by one of his disciples or by a later author inspired by his thought is a question for future research.

APPENDIX TWO

SUBSTANTIALIZATION (*TAJAWHUR*) AND THE CELESTIAL AND HUMAN INTELLECTS

Tajawhur, together with its verbal form *tajawhara*, is a term encountered in al-Fārābī's and Ibn Sīnā's philosophies and whose basic meaning is "substantialization" or "to become a substance." Although *tajawhur* may be compared to the Greek terms οὐσιότης ("substantiality") and οὐσιώσις ("substantification") that appear in several late antique Neoplatonic texts, these references provide little help for understanding the way in which al-Fārābī uses it.[1] As A. M. Goichon noted in her *Lexique de la langue philosophique d'Ibn Sīnā*, the meaning of this concept is difficult to pinpoint, and it seems at first glance to have been used more consistently by al-Fārābī than by Ibn Sīnā.[2] The following paragraphs will attempt to shed light on these issues and to clarify the meaning and function of this concept in al-Fārābī's cosmological system.

It should be noted from the outset that *tajawhur* is a ubiquitous concept. Al-Fārābī uses it in both a sublunary and superlunary context and applies it to entities as varied as the human soul, the celestial bodies, the separate intellects, and the First Itself. As a result, *tajawhur* overlaps the physical and metaphysical disciplines. In spite of this, one notices that al-Fārābī applies this concept primarily to things that are already substances (sing. *jawhar*), and, what is more, to substances that either have attained their highest state of perfection, such as the separate intellects, or which strive to attain them through motion and actualization, such as human beings. *Tajawhur* therefore relates to both immaterial entities and bodies. But here an important distinction applies, for while the intellects are from the outset (*min awwal al-amr*) in their highest state of perfection and always in actuality, other substances, such as the human soul, need to engage in change or motion to fully actualize their nature. It would seem, then, that *tajawhur* can be envisaged both as a process and as a state, depending on which beings it is applied to.

There are several passages in the Fārābīan corpus that are liable to shed more light on the concept of *tajawhur*. One of them appears in *Ārāʾ*, where

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[1] See the entries in Liddell and Scott's *Greek-English Lexicon* (1996, 9th Edition), 1275. These terms were used by Damascius, Elias, and other Neoplatonists, some of whose works were translated into Arabic. It is possible that al-Fārābī is drawing directly from one of the Arabic translations of these Greek works, in which these words would have been rendered by the Arabic term *tajawhur*. According to Walzer (in al-Fārābī 1985a, 342), there would be a connection between *tajawhara* and the Greek term *ūsiūsthai*.

[2] Goichon (1938, 52).

al-Fārābī explains that human beings are substantialized (*tajawhara*) by virtue of their rationality or rational speech (*nuṭq*), and where he furthermore distinguishes this mode of substantialization from God's unity and perfection.[3] This statement should be interpreted in the context of al-Fārābī's anthropology, according to which humans are distinguished from the other sublunary existents due to their capacity for rational thought. This difference enables humans to reach a state of perfection that is inaccessible to the non-rational animals. By virtue of their intellect, humans are connected with, and share an aspect of, the supernal, divine world, and it is only by fully engaging in its contemplation and study that they can hope to actualize their potential for wisdom and happiness.

In both the human and celestial contexts, *tajawhur* seems to be used primarily to indicate the role of the rational soul in actualizing the potentialities inherent in a being and in bringing this being to its utmost existential perfection. But al-Fārābī contrasts human perfection and divine perfection, or human substantialization and divine substantialization, on the grounds that human thought or speech is a discursive activity. Consequently, it is clear that the substantialization of human beings consists of a process that unfolds in time and involves change. More specifically, it is a process which requires the cultivation of the intellect and the ratiocinative faculties by means of study or reflection. From an Aristotelian perspective, one could say that *tajawhur* occurs when humans actualize their potentiality for knowledge.

Whereas human intellection is constantly shifting from potentiality to actuality, thereby implying a gradual and chronological substantialization, celestial intellection is in contrast eternally actual and unchanging, which means that the celestial substance itself is always actualized and in a state of utter perfection. As al-Fārābī asserts in *Siyāsah*, "the celestial bodies are, in their substances, always in a state of final perfection." As a result, the planets have motions that "come out of their final perfections" and that are "never interrupted, not even for an instant."[4] According to al-Fārābī, all the superlunary beings are in a state of actuality and utter perfection 'from the outset' and do not suffer from potentiality, except the celestial bodies which have only a potentiality for circular motion. Thus, al-Fārābī opposes the changing and temporal substantialization of humans to the immutable, atemporal, and eternally perfect essence of the divine beings. In the latter case, substantialization is co-extensive with their constant and non-discursive contemplative activity.

Al-Fārābī provides additional information on the substantialization of the celestial bodies in *Ārāʾ*, when he explains that they become "substantialized" (*tajawhara*) by virtue of their souls. The celestial bodies are said to have "things [intellects] that are like forms and through which they [the celestial bodies] become substantialized [*wa-ashyāʾ hiya lahā ka-l-ṣuwar bi-hā tatajawharu*],"[5]

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[3] Al-Fārābī (1985a, 92–93 and 1985b, 56).
[4] Al-Fārābī (1964, 102).
[5] Al-Fārābī (1985a, 120 and 1985b, 70).

a statement which is mirrored in *Siyāsah*.[6] Finally, al-Fārābī says something quite similar in *Fī l-ʿaql*, but the emphasis this time is on the agency of the separate intellects rather than on the activity of the souls:

> Every celestial body is set in motion only by a mover that is neither a body nor in a body in any way. [This mover] is the cause of [the celestial body's] existence, inasmuch as it is that by virtue of which [the celestial body] is a substance [*tajawhara*].[7]

This passage clearly defines the *thawānī* as the main causes for the substantialization of the celestial bodies, here understood in terms of both efficient and final causality. The *thawānī* cause the substances of the orbs and planets to exist, but they also inspire the contemplation and the movement of reversion of these entities toward their originative source, which allows their full actualization to take place. But since this act of reversion is eternal and continuous, the substantialization of the heavenly bodies is necessarily eternal as well, which means that they are in an unchanging state. At the heavenly level, then, the verb *tajawhara* refers not to a process involving change, but rather to the state of actualization of the heavenly bodies' substance that results from the contemplative activity of their soul and, more precisely, from their intellection (*taʿaqqul*) of the higher principles. This in turn indicates that *tajawhur* is essentially connected with the concept of final causality.

In *On the Soul* 2.1, Aristotle had established an identity between soul and actuality when he wrote that the soul "is the first grade of actuality of a body."[8] While al-Fārābī's concept of *tajawhur* may be construed as the actualization of the soul in an Aristotelian sense, it is more likely that it was informed by late antique Neoplatonic trends, which gradually came to see the soul as a source of perfection for the body by interpreting actuality (*entelekheia*) as perfection (*teleiotês*).[9] More specifically, al-Fārābī seems to be following Proclus' distinction between various grades of perfections and applying these notions to his cosmology, although there are differences in the way in which these two thinkers defined them, which have been discussed by R. Wisnovsky.[10]

Yet, and this seems contradictory, al-Fārābī's concept of substantialization is also connected at another level with deficiency and imperfection (*nuqṣān*). The substantialization of the heavenly bodies is a result not just of their intellection, but more specifically of their contemplating a diversity of intelligibles: the First, the separate intellects, and their own essence. In *Siyāsah*, al-Fārābī explains that the heavenly bodies are more deficient than the separate intellects, because the "plurality by which they substantialize themselves

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[6] Al-Fārābī (1964, 34): *wa-bi-hādhā* [the rational soul or intellect] *tajawhara l-ajsām al-samāwiyyah*.

[7] Al-Fārābī (1938, 34).

[8] Translated by Smith (in Aristotle 2001).

[9] Winosvsky (2003, ch. 1).

[10] For a comparative analysis of Proclus' and al-Fārābī's theories of actuality as perfection, see Wisnovsky (2003b, 108–112).

is greater than that of the *thawānī*."[11] The celestial bodies share the concept of *tajawhur* with the separate intellects, and in both cases this concept is attached to complexity or multiplicity (*kathrah*), but it is associated with a different degree of multiplicity in each case. As for the First, in contrast to both the *thawānī* and the celestial souls, Its substantialization does not rely on any exterior thing to be complete—including an intelligible outside of Its essence—and therefore it does not suffer from any degree of complexity. Al-Fārābī uses the verb *tajawhara* negatively when speaking about the First in order to stress that It does not need any exterior agent for its substance to be complete, one, and perfect.[12] In the separate intellects and celestial souls, however, the two concepts of *tajawhur* and *nuqṣān* are intricately connected. Substantialization can refer simultaneously to the state of perfection and actuality reached by a substance and to the complexity and deficiency which underlies its nature as a caused existent.

Finally, the concept of substantialization also represents a convenient tool al-Fārābī uses to compare human and celestial psychology. In *Fī l-ʿaql*, he explains that when a person reaches the stage of the acquired intellect, "the substance of man, or man by virtue of what constitutes his substance, becomes the closest thing possible to the Agent Intellect."[13] Like the celestial bodies, human beings become substantialized through intellection, and more specifically by cultivating their rational soul until it becomes an acquired intellect (*ʿaql mustafād*). But this is rendered possible only by connecting with the Agent Intellect, which explains why the more human beings substantialize themselves through contemplation, the more their substance—here defined as their rational soul—resembles the Agent Intellect, which is the source of their rationality. In both cases, then, the full realization of the substance that are the human and celestial souls is brought about through the contemplation of higher principles that are identical for both, namely, the immaterial existents. This connection between al-Fārābī's cosmology and psychology is further fleshed out in *Taḥṣīl*, when he writes that

> This inquiry into the rational animal will thus lead him [the philosopher] to a similar conclusion as the inquiry into the heavenly bodies. Now he acquaints himself with incorporeal principles that are to the beings below the heavenly bodies as those incorporeal principles (with which he became acquainted when investigating the heavenly bodies) are to the heavenly bodies. He will acquaint himself with the principles for the sake of which the soul and the intellect are made, and with the ends and the ultimate perfection for the sake of which man is made.[14]

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[11] Al-Fārābī (1964, 40–41): *al-kathrah allatī bi-hā tajawharahā azyad mimmā tatajawharu bi-hī l-thawānī*.

[12] Al-Fārābī (1985a, 66–67, 92–93 and 1985b, 44, 56).

[13] Al-Fārābī (1938, 31) and McGinnis and Reisman (2007, 76, translation slightly revised): *fa-yaṣīru ʿinda dhālika jawhar al-insān aw al-insān bi-mā yatajawharu bi-hī aqrab shayʾ ilā l-ʿaql al-faʿʿāl*.

[14] Al-Fārābī (2001c, 22).

What is interesting in this passage is al-Fārābī's emphasis on intellection as the perfection and end for both human and heavenly beings. What unites human and heavenly souls in a harmonious and universal scheme is the possession of a rational faculty that enables them to fulfill a common nature and complete their perfection. This helps to explain why al-Fārābī applies *tajawhur* to both the human and celestial intellects.[15]

The affinity between human and celestial psychology in al-Fārābī's works is furthermore illustrated by the principles of form and substrate, which are applied to both types of souls. For example, *Fī l-ʿaql* compares the various stages or faculties of the human intellect to form and substrate, thereby establishing a pendant to the emanationist treatises, where these same concepts are applied to the celestial bodies. This practice with regard to human psychology, as well as part of its terminology, can ultimately be traced to Aristotle's *On the Soul* 3.4-5, but unlike the Stagirite al-Fārābī applies this terminology to the heavenly souls as well. Accordingly, both the celestial and human rational souls can be defined as forms (sing. *ṣūrah*) that inhere in a substrate. The use of a common terminological and conceptual framework in these two contexts explains why al-Fārābī discusses human and celestial psychology in the same works and even in the same passages.[16]

The foregoing comments, and in particular the common application of *tajawhur* to the celestial and human contexts, raise the question of the exact relation between these various kinds of souls. In al-Fārābī's ontological hierarchy, human beings are the only sublunary existents to possess reason, and it is by virtue of their rational soul that they are connected with the higher levels of the universe. This commonality appears clearly when al-Fārābī says that heavenly and human souls are "similar" or "congeneric" (*mujānisah*).[17] This statement suggests that both types of souls belong to a common genus, although they may not be exactly of the same nature.

This point is further refined when al-Fārābī explains in this same passage that the heavenly souls differ from the human souls "in species" (*fī l-nawʿ*) and that the former are detached and separated from the latter "in their substances." This difference can be explained by the fact that the heavenly intellects are "always actual" (*dāʾiman bi-l-fiʿl*), whereas the human souls pass from a state of potency to one of actuality. Both types of souls contemplate different intelligibles: the celestial souls, al-Fārābī writes, "definitely do not contemplate the majority of the intelligibles that humans contemplate from things in matter because they are too far in rank by virtue of their substance to intellect the intelligibles that are below them."[18] Finally, whereas human intellects need to abstract forms from their material substrates before they can be apprehended

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[15] For *tajawhara* as applied to the human mind, see al-Fārābī (1985a, 92 and 1985b, 56); for the celestial intellects, see al-Fārābī (1985a, 120–121 and 1985b, 69).

[16] See for example al-Fārābī (1938, 34–35 and especially 1964, 33–34).

[17] Al-Fārābī (1964, 34).

[18] Al-Fārābī (1964, 33–34) and McGinnis and Reisman (2007, 82–83, translation slightly revised).

as intelligibles, the celestial souls do not need to perform this process of abstraction.

These points highlight the important epistemological and cognitive differences between the celestial and human souls and suggest that it is not possible for the human intellect to fully assimilate the knowledge of the celestial beings, at least during one's earthly life. In spite of this, the human souls can, by reverting to the higher or prior ontic principles and by cultivating contemplation and theoretical knowledge, bring their substance to its fullest degree of actualization and perfection and experience *eudaimonia* (*saʿādah*). In that sense, *tajawhur* is a concept that is also intimately linked to the possibility of human happiness in this life.

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